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AVMA ☆ Report

Veterinary Medical Activities

✦ The annual AVMA Convention in Detroit, July 11-14, provided two important opportunities to its members: An opportunity for orderly, democratic expression of opinions and desires for the consideration of the executive and legislative bodies; and an opportunity to learn the latest in all branches of veterinary medicine by attending the program sessions and participating in the discussions.

★ ★ ★

✦ Dr. W. M. Coffee, LaCenter, Ky., is the President-Elect of the AVMA for 1949-50, as a result of the election at Detroit. The vice-presidents are: Drs. W. F. Irwin, O. A. Lopez, J. M. Veilleux, C. A. Brandly, and A. E. Bott. Dr. W. A. Young was re-elected treasurer (*See* the News section for further details).

★ ★ ★

✦ Dr. Gerard Dikmans, U.S. Bureau of Animal Industry, Beltsville, Md., was awarded the Twelfth International Veterinary Congress Prize. This was in recognition of his many years of service to the profession in the field of veterinary parasitology.

★ ★ ★

✦ Dr. R. R. Birch, New York State Veterinary College, Ithaca, N. Y., received the Borden Award for outstanding research in dairy cattle diseases. The decision was based upon work with brucellosis and other diseases, and the discoveries which reduced the losses occasioned by them.

★ ★ ★

✦ Dean H. D. Bergman, Iowa State College, Ames, is a member of the Executive Board of the American Association of Land Grant Colleges and Universities. In this capacity, he represents the Association of Deans of American Colleges of Veterinary Medicine, and also the profession at large.

★ ★ ★

✦ Richard Rose, Detroit, Mich., was the nominee deemed most worthy of the annual AVMA Humane Act Award. This 17-year-old boy was so solicitous of his 16-year-old pet dog that he built a bumpered headgear which would prevent bruising of the head as the animal slowly lost its sight.

★ ★ ★

✦ President-Elect (now president) C. P. Zepp, Sr., completed his pre-Convention tour of meetings by attending the sessions of his home state association—New York, in New York City, June 23 to 25.

★ ★ ★

✦ Editorial comment in *Feedstuffs* (June 25, 1949) agrees with the AVMA editorial (June) "Will Drugged Feeds Replace Good Management," but believes that drugged feeds are a noteworthy achievement in disease control, and urges that veterinarians recognize it as such.

★ ★ ★

✦ BAI Chief B. T. Simms recently visited the Association office for a conference. The discussion centered around ways and means through which the U. S. Bureau of Animal Industry and the AVMA could coördinate their efforts for the greatest benefit to the livestock industry through participation of veterinary practitioners in disease control programs.

★ ★ ★

✦ Recent visitors from abroad at the AVMA office include: Drs. I. J. Cunningham, superintendent, Wallaceville Research Station, Dept. of Agriculture, New Zealand, and L. K. Whitten, parasitologist at this station; Dr. P. A. Rogan, head of the Veterinary Service, Irish Republic, Dublin, Ireland; and Dr. A. W. Stableforth, assistant director, Veterinary Laboratory, Ministry of Agriculture and Fisheries, Weybridge, England.

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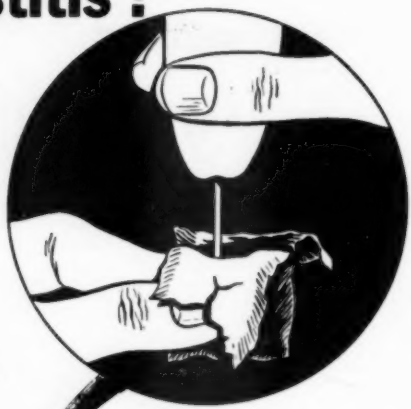

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1. Collins, J. H., J.A.V.M.A., Oct. 1948 *Caused by Strept. agalactiae

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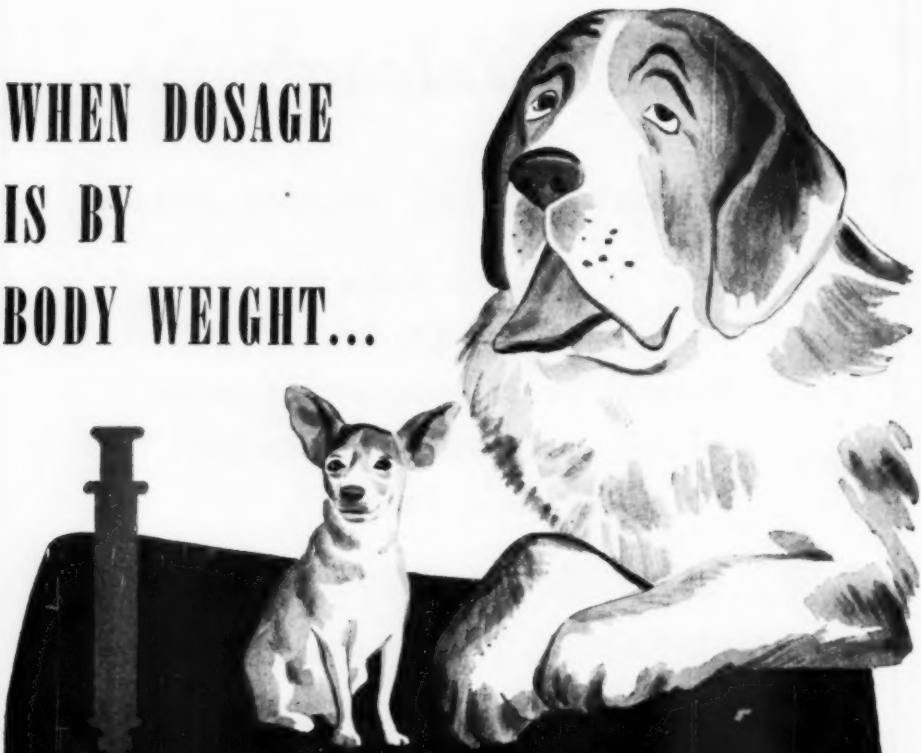

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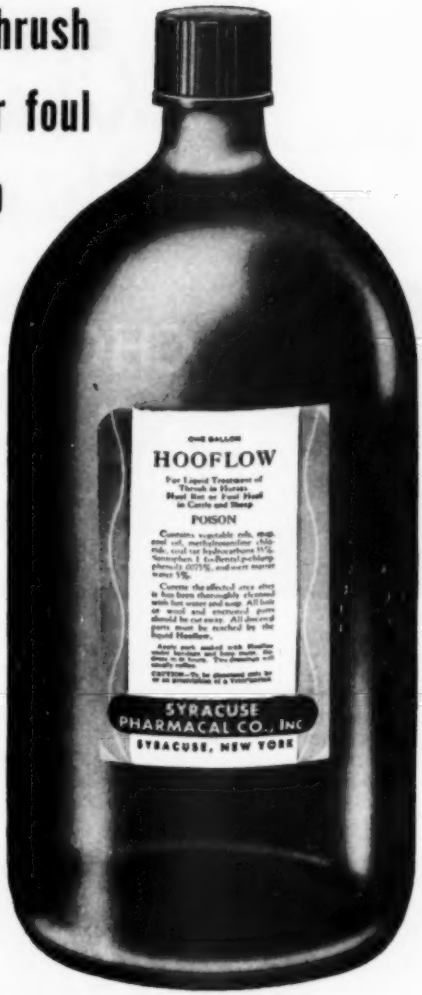

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Journal
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VOL. CXV AUGUST, 1949 NO. 869

Developments in the Regulatory Control of Animal Disease in Germany

LIEUTENANT COLONEL FRANK A. TODD, V.C., U. S. Army

Washington, D. C.

DURING the period in which the author was chief of the Veterinary Service of the Military Government in the U.S. Zone of Germany, official duties provided ample opportunity to review and investigate German customs pertaining to veterinary medicine, animal disease control, and other allied fields of science. Information required for quadripartite negotiations, relative to preparing uniform disease control programs for all of Germany and for recommendations repealing nazi legislation regulating veterinary medicine, made it necessary to study the historical background of these laws.

A review of the German legislation pertaining to this profession and science reflects the effects of early beliefs, superstitions, and the complete absence of scientific knowledge in attempts, at that time, to halt the spread of diseases. A student of today, after studying these early conditions, should have a still greater admiration for such German scientists as Ehrlich, Koch, Behring, and others who began their initial work with imagination, conducted it with industry, and had the persistence to follow it through to a logical conclusion.

EARLY HISTORY OF ANIMAL DISEASE CONTROL

German attempts to control animal diseases are reported as early as the Eighteenth Century. At this time, an epizootic of rinderpest was sweeping across western Europe causing heavy losses among cattle. Control measures included destruction. Between 1769 and 1778, 60,000 cattle were lost in this manner in Brandenburg Province alone. The Decree of 1711, by King Frederick I of Prussia, and the Decree of 1712, by King Frederick August of Poland, are among the earliest national measures adopted for rinderpest control in cattle. These decrees were changed almost yearly during the next forty years.

Although the early decrees were without scientific foundation, their provisions are generally accepted today. Import restrictions, animal quarantine procedures, isolation, branding, disinfection, and issuance of health certificates were mentioned in the decrees. The removal of bodies of animals having died of disease also was emphasized and was the probable cause for the animal disposal system now used in Germany. In retrospect, it should be noted that "cattle plague," a term used during this time and in the decrees, may have referred to rinderpest, contagious pleuropneumonia, or foot-and-mouth disease, and serves to indicate how little was known of animal diseases and how helpless were the nations and their people in facing such catastrophes.

As early as 1800, it was observed that few animals with contagious pleuropneumonia completely recovered from this disease. The long incubation period was already known at the time, as is indicated by the requirements that cattle suffering from the disease be branded on the horns with the letters L.K. (lung disease), and that the cattle be released for sale no sooner than three months after complete disappearance of the symptoms of the disease. Remedies were regarded as useless, and only isolation prevented its spread.

Foot-and-Mouth Disease.—A Prussian decree of 1732 describes foot-and-mouth disease in cattle and records reveal that it was widespread in western Europe dur-

ing the previous year. At the time, it was called "mouth decay" and was treated by a remedy recommended by West Prussian veterinarians and approved by no less than the famous physician of the King, Hufeland. A detailed description of "mouth-and-foot ache" may be found in the official gazette of Breslau (1816). It is interesting to note that in 1843 an expert from the veterinary school of Berlin voiced the opinion that veterinary police measures against foot-and-mouth disease were not necessary.

Sheep Scabies and Pox.—Sheep scabies is mentioned in the oldest disease-control regulations pertaining to the sheep industry, published in the Seventeenth Century. Districts, referred to as "smear county" were designated; and scabies-infected sheep from clean areas, or in areas where the treatment of such sheep was prohibited, were transported for holding in such districts. Regulatory laws promulgated in 1746 required that all infected sheep be reported and be grazed separately. Traffic of animals between clean areas and designated districts was well regulated. The regulations were amended later to include instructions for the treatment of scabies-infected sheep and the requirement for the disposal by burning or burial of the hide and of the wool shed from infected animals and carcasses.

The presence of sheep pox, in 1806, brought about the issuance of pertinent regulations providing for protective vaccination. In 1815, sheep pox spread to a devastating degree which necessitated new regulations. The publication of the Bromberg Government, issued at that time, reveals that of 46,150 sheep infected, 6,980 died.

Mange in Horses.—As a means of controlling mange of horses during the middle part of the Eighteenth Century, it was forbidden to skin dead animals infected with this disease. This restriction was based on the theory that dogs and foxes feeding on the skinned carcasses left in the field would become infected and would, in turn, transmit this condition to the local flocks of sheep. An amendment was made to this regulation about 1834 resulting from recommendations of the faculty of the veterinary college of Berlin.

During the Napoleonic War, scabies infection or mange in horses became so widespread that it was the subject of a regulatory decree of the Potsdam Government issued in May, 1810. Although the mange mite was reported by Kresting, in 1789, the Potsdam decree indicated the supposition of the period that cases of mange frequently developed into tuberculosis, "worm disease," or glanders. Actually, the mange mite, as described in 1789, was not recognized as the causative infective agent until 1844 by Guret and Hartwig, or 1857 by Gerlach. Equine mange was even then considered a war disease, this being proved again in World War I when it caused great losses of animal efficiency of the Allied and axis powers.

Equine Glanders.—Glanders in horses, also, was recognized as a wartime disease. During the troublesome times in the early nineteenth century, glanders became widespread throughout Europe. Special disease control regulations were put into effect in Germany. Actually, in 1827, there was some doubt whether or not glanders was communicable to man. Diseased horses were destroyed, and animals exposed to the infection were isolated. Horse owners were directed to educate their employees or stablemen on the characteristics of the disease, and to call for the services of a veterinarian or a physician in doubtful cases.

Anthrax.—Anthrax, another disease of historical significance in German animal disease-control regulations, was reported to be infectious for horses and cattle and dangerous to human health in 1803. Opinions, however, were divided. In the middle of the nineteenth century, the reporting of outbreaks of anthrax was made mandatory. Diseased animals were isolated and could be treated only by trained physicians. The animals could not be slaughtered for food. Carcasses of diseased animals could be dissected by physicians and veterinarians only, and disposed of only after the carcass lost its body heat. Hagner, in 1869, recommended that sheep carcasses be skinned for their hides and that such hides be dried and disinfected.

Rabies.—The control of rabies, recognized early as a disease communicable to man, was influenced by very ancient beliefs. Edicts of 1761 and 1767 required the so-called "man-worm-cut," which was the cutting off of a harmless piece of epithelial tissue of the tongue. Dogs were treated by a person specially appointed for the purpose. Failure of owners to comply resulted in a fine of 50 *thaler**, plus a shooting fee of 3 *thaler* for the destruction of the animal. On the other hand, the surgical operation cost 2 *groschen*** in the urban areas, and 1 *groschen* in the rural sections, plus an additional *groschen* for a certificate. In 1797, these regulations were amended requiring the use of a specific remedy known as *"electurarium contra morsum*

*One *thaler* was equivalent to 3 *marks*.
**One *groschen* equivalent to 10 *pfennig*.

canis rabide." It was an oily extract of the May beetle. About the same time, more appropriate regulations were issued, based on the current idea that dogs at large and uncontrolled favored the spread of rabies. Stray dogs were killed, while dogs kept for security purposes or for hunting were chained or had a large wooden stick attached to their collars to prevent them from running. As late as 1784, farmers believed that cattle bitten by rabid dogs could be successfully treated by having them bled with the executioner's sword. This superstition was not supported by authorities, who prohibited this method of treatment and required the killing of the animal. In 1804, the treatment of exposed dogs was prohibited. In 1835, rabies in Germany was handled by the destruction of infected and exposed dogs. Physicians were to observe all suspected dogs. The observation of such animals by untrained physicians was prohibited, and only with the permission from the police could physicians and veterinarians do so.

Early regulations required butchers to become acquainted with the symptoms of animal diseases and to pass an examination before a muncipal or district physician. In some provinces, the cattle dealers were included in the regulations. Control measures were caried out by the governing official (*Landrat*), with technical advice from the district physician. Veterinarians were excluded from this responsibility and were required only to report suspected cases. The district physicians and surgeons were regarded as assistant and technical consultants to the executive officials (*Landrat*) and were required to make immediate investigations when contagious animal diseases were recorded.

EARLY REGULATIONS

Regulations on a state-wide basis were not issued until 1835, when the Prussian government published its "Regulations of the Sanitation Police for the Most Frequently Occurring Contagious Diseases." These were significant from a veterinary standpoint, because they contained instructions on the control of rabies, glanders, and recognized parasitic diseases, and for the first time mentioned veterinarians along with physicians. District physicians and surgeons were still regarded as assistants and technical consultants to the executive official with whom they had to make investigations of each outbreak of contagious animal diseases. The early regulations for the control of animal diseases in Germany were exclusively influenced by the physician. This situation evolved because there was then no scientific veterinary medicine. Veterinary schools were set up at Hannover and Berlin in 1778 and 1790, respectively, but many years passed before veterinarians became responsible for the control of animal disease.

Animal disease statistics were first required in Prussia in 1729. Saxonia adopted the requirement in 1780.

The penalties for violations of the older regulations were markedly severe, if they are contrasted with those prescribed in current laws and regulations. In spite of the continued renewal of regulations and threats of severe punishment, success was not achieved. This, of course, was due to lack of scientific basis or understanding of animal diseases and manner of their spread. The failures and defects of legislation, the ever-increasing animal population, and newer aspects of livestock in the national economy required frequent readjustment of animal disease regulatory controls.

In 1803, Prussia issued instructions for the prevention of cattle plague and other infectious animal diseases, together with procedures to be used in the event of death of an animal. The document contained 171 sections, dealt primarily with rinderpest, and included the first measures against contagious pleuropneumonia, anthrax (which at that time included more than is considered by the term today), and rabies. These instructions were amended in 1836 and required cattle of the steppe breed (Podolian) to be quarantined for twenty-one days before entering the country. It also provided that, in the event of an outbreak of rinderpest abroad, all cattle would be quarantined prior to importation. Glanders was not mentioned, but the disease was noted earlier in the decree of 1772 pertaining to carcass disposal plants. Glanders-infected horses could be disposed of by the persons in charge of rendering companies. At this time, the skinning of animals suffering from anthrax and rabies was permissible, but the removal of tallow and other tissues was prohibited. In 1804, the skinning of rabid animals was prohibited, because "froth may be hidden in the hairy parts of the skin."

The other German states gradually adopted measures similar to those applicable in Prussia for the control of animal diseases. The requirements were determined by such scientific knowledge of diseases as was available at the time of the promulgation of the decrees. Control measures were largely a conglomeration of restrictions based on theories and ideas pertaining to each individual disease. The lack of scientific knowledge of the nature

of contagious diseases was a principal fault, and the lethargic methods of administration and lack of trained veterinarians resulted in little or no success in animal disease control. The end point of this confusion and ineffective legislation was reached about the middle of the nineteenth century when, in the northern parts of Germany, uniform control measures and legislation were officially adopted and the veterinary police made subject to government control as a governmental agency. After the establishment of the German *Reich*, this law became effective for the whole of Germany and, with slight revision, remains in force today. The law required the enforcement of stringent control measures. The destruction of sick and suspect animals, with proper compensation to the owners, plus restrictions on the importation of ruminants from permanently contaminated eastern countries, provided a successful measure toward eradicating animal disease.

The other German states were apparently convinced of the futility and existing confusion in their animal disease-control legislation. Veterinary legislation was initiated for Bavaria in 1858. In 1862, Adam, a Bavarian veterinarian, stressed the importance of standardized regulations and published a book containing pertinent directives. In the same year, the Bavarian police penal code included the first attempt to standardize the control procedure in Bavaria. This culminated in the passage of the Bavarian animal disease law of 1867. Baden adopted similar measures in 1865. A manual on veterinary police was published several years later by Haubner and was considered an excellent publication, comparable to Gerlach's "Forensic Veterinary Medicine."

MODERN ANIMAL-DISEASE LEGISLATION

As early as 1850 and 1860, state authorities in Prussia agreed that all legislation pertaining to animal diseases needed a thorough revision consistent with the latest scientific facts. This was accomplished in 1875. The under-secretary of state in the Prussian Ministry of Agriculture, Marcard, provided in this law that veterinarians were responsible for the technical control of animal diseases, which up to this time had been conducted by district physicians. Marcard, thus, was the founder of modern animal-disease legislation. The new law designated all diseases which were considered important to the national economy and which could be controlled with some success. After a five-year test period, during which its effectiveness was proved, the law was raised to the status of a *Reichs* law in 1885, almost in unchanged form. Early amendments to the law dealt almost exclusively with the control of foot-and-mouth disease. It also delegated to the state governments the authority to order protective vaccinations against contagious pleuropneumonia. During the next several years, this authority was transferred from one level of government to another and resulted in impeding the control of contagious pleuropneumonia. Such vaccinations were later discontinued.

In the following years, advances in bacteriology produced many new discoveries in animal disease. Research findings and the recognition of new diseases such as pasteurellosis, swine fever, and swine erysipelas revealed the urgency of changing the animal disease legislation to conform with the scientific findings of the period. The result of all this new legislation was the *Reichs* animal disease-control law of June, 1909, which became effective on May 1, 1912. This law is still in effect today. This newly adopted *Reichs* law provided a uniform basis for the control of animal diseases throughout Germany. It did allow each state or province to issue additional implementing regulations for control measures and compensation procedures required by established customs, local rural architecture, and terrain features.

The control of bovine tuberculosis in Germany was started about 1910 in accordance with the Animal Disease Law of 1909. That part of this law dealing with the control of this disease was based on the recommendations of Professor Robert von Ostertag. The method included: (a) determining adult cattle infected with "open cases" of tuberculosis (open cases interpreted as infection of the lungs, udder, uterus, or the intestines, to be determined by demonstrating the presence of the tubercle bacillus therein); (b) destruction of those animals with open tuberculosis and indemnity payment to the owner; (c) tuberculin testing of calves with the slaughter of reactors; (d) feeding of only thoroughly heated milk to calves. This control program was not compulsory but was practiced extensively throughout Germany until before World War II when the effectiveness of the plan was questioned as a method of eradicating the disease. This control program fell far short of being satisfactory for eradicating tuberculosis because, since it was not compulsory, infected farms were allowed to operate in those areas where the program was being conducted; the methods of determining open cases of the disease were not accu-

rate; the movement of cattle was not satisfactorily controlled; the proper disinfection and stable hygiene were not practiced; and the financial support was inadequate for such a program.

Changes in the Ostertag method have been recommended and tried. In 1915, Land (state) Baden instituted changes which resulted in more successful results. This program was improved in 1938 and resulted in an ordinance of Dec. 15, 1943, with the following features: (a) methodic and compulsory control measures applying to the entire Land; (b) requirement of both clinical examinations and tuberculin tests in the search for infection; (c) separating healthy animals from infected ones; (d) recording of purchases, sales, and births of animals; (e) payment of indemnity for the slaughter of diseased animals and premiums for milk produced from healthy herds. The finances for conducting this program are provided by the state and animal disease fund, with the cost of veterinary service being paid for by the cattle owner. This method of control has been successful in this Land.

Due to the demands of war, the administration difficulties, and the lack of veterinarians, the control of tuberculosis in Germany ceased. It is generally agreed by the veterinary experts in Germany today, that the Ostertag plan contained many defects and that, if bovine tuberculosis is to be effectively controlled on a country-wide scale, a more modern method must be adopted.

Control measures for brucellosis of cattle, prior to 1920, consisted primarily of the use of various types of vaccine prepared by veterinary institutes and serum companies. In 1923, police regulations pertaining to cattle epidemics limited the use of live-culture vaccines to those infected herds selected by veterinary institutes. The use of this type of vaccine in conjunction with hygienic measures reduced the number of abortions in badly infected herds.

Because of the increase in cases of undulant fever appearing in the civil population at this time (1930), the medical authorities demanded that the use of live-culture vaccine be prohibited at once. Practicing veterinarians engaged in brucellosis control and the directors of the various veterinary research laboratories voiced disagreement over this action.

However, due to the war requirements for increased food production, and pressure exerted by agriculture, the minister of the interior, in 1942, decided to approve the use of live-culture vaccines. Restrictions on the use of this type of biological product allowed its use only in those herds that were known to be heavily contaminated with the disease or in those animals exposed to infection from the causative organism, and then only after an approved request from the subordinate administrative authority (*Landrat*) was received for each herd.

Control work recently carried out in the United States, Great Britain, and Denmark have impressed the German authorities and similar control programs, using U.S. strain 19, are being considered. The Veterinary Service of Military Government of Germany, through the Bureau of Animal Industry, obtained and made available to the German Veterinary officials necessary cultures, together with experimental literature and field reports relative to brucellosis control in the United States.

The importance of uniform animal disease-control measures for all of Germany can not be overemphasized. This was recognized by the veterinary consultants of the occupying powers of Germany and necessary steps were taken to enact similar legislation in each zone for preventing the spread of communicable animal diseases and improving the methods of control for such public health and economic livestock diseases as tuberculosis and brucellosis.

CONCLUSION

Present German veterinary scientists have been among the leaders of the world in the field of veterinary research and animal disease control. Most recently, the work of Waldmann and Traub in producing an effective vaccine for the control of foot-and-mouth disease and establishing the importance of the several types of virus has been recognized. A new adsorbate type swine erysipelas vaccine has been produced by Traub. Field experiments indicate it to be a big improvement over the simultaneous method now generally used.

German veterinarians will continue to discover more effective methods for controlling communicable animal diseases, along with evidence of the need for improved legislation relative to modern veterinary preventive medicine and disease control. The result of research now in progress will be apparent in quality and quantity of livestock and in higher standards of public health for Germany.

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Veterinarians in Public Health Work

Speaking before the Institute on Public Health Practices for Veterinarians, conducted in Springfield, Ill., March 21-23, 1949, Dr. Roland R. Cross, director of the Illinois Department of Public Health, said: "Today, I hope, marks the turning point in Illinois when the veterinary profession will become partners to public health as well as to agriculture, and when the conservation of human health will be as much a part of the veterinarian's job as is the conservation of the farmer's investment in livestock."

The conference was described as the first of its kind ever to be held in the United States.

Perpetual Motion.—An example of perpetuity of motion is the congressional action on the status to be given military veterinarians, started in 1877 by the AVMA, which still ticks on and on.

The Fabulous Domestic Musk Ox

When *Harper's* came out about three years ago with a piece on a "marvelous arctic animal" that animal husbandry was overlooking as an economical replacement for beef cattle, no particular attention was paid to such a fabulous tale. The author was Vilhjalmur Stefanson, famous as an Arctic explorer, geographer, and lecturer, but obviously short on knowledge of animal life. He was cocksure that the musk ox could revolutionize animal industry if given a trial. There was nothing in the report to indicate that the writer had ever been nearer to one than the range of a 30-30. Anyhow, nothing was said about the little matter of its tamability, breeding habits, or nutritional needs. The promise was lots of edible flesh, milk, digging the snow for feed, and vigor galore, and, believe it or not, the author came up with the same tale before the North American Wildlife Conference at Washington in March, where it was promptly debunked by experts of the U.S. Fish and Wildlife Service, who have had twenty-five years experience with captive musk ox herds in Alaska. Let Dick Griffith and Frank Dufresne tell the story:

Muskoxen are viscious, aggressive, unpredictable—in short untamable. They could, and did, break through 2-in. board fences, never got used to human beings though handled daily through several generations. Keepers were afraid to shear them and there is no evidence that any native has ever tamed one. They grow slowly, breed sparsely, and in a strange climate stop breeding entirely. The Fairbanks herd increased only from 34 to 60 in eighteen years. They are Polar bears with horns. It would be a great tragedy for people to get the idea they could raise them easily. Somebody would certainly get killed.

It would seem reasonable for great magazines like *Harper's* to shop around for information concerning a "revolution" in a basic industry involving an investment of around 9 billion dollars and a main source of human subsistence. Intelligent people like facts more than entertainment when they give up precious hours to reading.

Early Japanese Medicine.—A delegation of physicians of the American Medical Association, headed by President Roscoe L. Sensenich, on an official visit to Japan last year were presented with a copy of Vol. I, No. I of the *Journal of the American Medical Association* printed (by permission) in the Japanese language. The J. Am. M. A. is now in its 138th volume.

Laboratory and Field Technique to Determine Fertility in the Bull

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PRIVATE breeders and owners of bull studs usually want a bull checked for fertility before they purchase it. Since a veterinarian is usually called to make this evaluation, it is essential that he supply himself with the necessary equipment to make these tests and determinations.

A clinical examination should precede the semen examination. Although the clinical examination and some of the semen tests can be conducted on the farm, many of the tests are of such a nature that they will have to be carried out in the laboratory. None of these tests is accurate in itself, but must be used in conjunction with other tests. The collective results of both the semen tests and the clinical examination will give a good indication of the bull's fertility. The history of the bull's breeding record will supplement this information; it must be realized, however, that conception rate is the positive indication of a bull's fertility.

CLINICAL EXAMINATION

An examination should be made to detect any anatomical abnormality. Palpation of the prepuce, penis, testicles, epididymis, accessory organs, and inguinal rings may reveal pathologic conditions that may impair the bull's fertility.

The preputial orifice, which should be roomy enough to admit two fingers, should be examined for small tumors, ulcers, or ingrown hairs; further up in the prepuce, palpation may reveal small ulcers or varicose veins.

The glans penis is palpated through the sheath. Tumors are commonly found on this organ, and may be papillomas, fibrosarcomas, or carcinomas.

The testicles (there should be 2) should be carefully observed to detect scars, abscesses, or a lack of symmetry. Large edematous testicles require the use of an aspiration biopsy needle to determine the type of fluid content. In diseases of the male genital tract, the epididymis is frequently affected. The normal epididymis feels like a mass of cooked spaghetti and should not be hard or unyielding.

The accessory organs are examined through the rectum. This examination should start at the ischial arch; the base of the penis should be located at this area, beyond which are the accessory glands. While the hand is in the rectum, the examiner should palpate the internal inguinal ring and thus complete the actual palpation of the genital tract.

Further examination of the penis may be simplified by forcing the penis out of the sheath and placing a gauze bandage behind the glans penis; by pulling steadily and tiring the muscles, the examiner can force the penis out about 1 ft., the distance being governed by the amount of mucous membrane reflected on the penis. When the bull mounts the cow or dummy, any muscle contracture in the retractor or protractor muscles of the sheath may be observed. It is important to determine whether the skin covering the sheath adheres to the abdominal wall.

When collecting semen with the use of an artificial vagina, the veterinarian should follow strict sanitary precautions. He must acquaint himself with some of the techniques that are recommended before he attempts to collect semen, as well as the technique in diagnosing certain diseases that would cause temporary infertility.

DIAGNOSIS OF DISEASES CAUSING INFERTILITY

A clinical examination is not complete without a consideration of *Trichomonas foetus*, *Brucella abortus*, or *Vibrio foetus*. Since they are usually associated with abortions in the female, and can be transmitted by the male, they are worthy of consideration. There are other organisms that may

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cause temporary infertility in the female and the male, but these will not be discussed because of their infrequent occurrence.

The agglutination test is the simplest one known for brucellosis, and should be made despite recent tests or herd history. This procedure is advisable because of the complexity of the disease. I am reminded of a bull presented to the Stange Memorial Clinic, Iowa State College, with a history of breeding difficulties and a large edematous right testicle. An aspiration biopsy needle was used to obtain fluid from the testicle; upon bacteriologic examination this fluid proved to be a pure culture of *Br. abortus.*

If the breeding record of the herd from which the bull was taken indicates frequent abortions, missed estrous periods, low conception rates, and other breeding difficulties, the veterinarian should consider infections due to *T. foetus and V. foetus.*

It is difficult to diagnose trichomoniasis in the individual bull. This protozoön will seldom be found anywhere but in the prepuce. If located elsewhere in the male genital tract, it was likely transferred there by manual means. When the sheath of the bull is badly contaminated, this organism will burrow deep into the sebaceous glands of the prepuce and will be difficult to secure. Two or three breedings will produce enough pressure on the prepuce to bring these forth so they can be identified.

The examination for trichomoniasis may be conducted by thoroughly flushing the prepuce with physiologic saline solution, collecting this fluid in a beaker, and allowing it to stand for ten or twelve hours. A cloudy precipitate will form at the bottom of the beaker. The fluid then should be decanted and, with a transfer loop, some of the precipitate should be placed on a slide, covered with a cover slip, and examined under high power with a dark field. Trichomonads are one-celled organisms. The examiner should be cautioned to distinguish the trichomonad from the one-celled soil organism, the Cercomonas, which is commonly found in the prepuce and on the preputial hair. The trichomonad has three flagella, a trailing flagellum, and an undulating membrane on the ventral side of the body, which is used as a means of locomotion. The Cercomonas has three flagella but no undulating membrane; it is more resistant than the trichomonad and will be found alive in preputial washes several days after collection. As it is a serious menace to accurate diagnosis of trichomoniasis, its possible presence should be kept in mind.

The organism *V. foetus* causes abortion and, by coitus, can be carried by the male from one female to another. In some instances, the bull never recovers but remains as a carrier. A diagnosis is supported by a history of breeding difficulties, a record of abortions, absence of trichomonads and Brucella organisms, and a bacteriologic examination of ejaculate and preputial washings.

Precautions in the Collection of Semen

1) A clean artificial vagina must always be used.

2) The water in the jacket must be 110 to 115 F.; some bulls may prefer a temperature of 120 to 130 F. There should be enough air pressure to correspond to the pressure of the penis in the vagina of the cow. Again, some bulls prefer different pressures than those which natural breeding provides.

3) Sterile petrolatum or gum tragacanth may be used as a lubricant.

4) A cow in heat will facilitate collection from a bull that has not used an artificial vagina. Where a cow is not available, a young bull is a good substitute.

5) The bull should obtain an erection and show evidence of a good amount of drippings from the sheath before he is allowed to mount.

6) The penis should never be grasped directly, but guided into the artificial vagina by deflecting the sheath from side to side.

7) If the bull soils the inner-liner or collecting tube before ejaculating, a clean vagina should be obtained before another ejaculate is collected.

8) The semen should not be allowed to chill. It should be examined immediately for motility, then cooled gradually to refrigeration temperature.

When the semen has been collected, the initial motility, appearance, and quantity tests must be conducted immediately. The sample then must be immediately protected from temperature shock. Spermatozoa will live several days if maintained at a temperature about 34 F. A practical way to handle semen after collection is to cork the collecting tube tightly and place it in a beaker of tap water, which usually varies from 65 F. to 70 F. Then the beaker should be placed in a thermos jug with a can of ice. This will allow the sperm to cool at the rate of 5 degrees in twenty minutes, a drop in temperature which will not shock the spermatozoa. The veterinarian may then proceed to his laboratory to conduct the remainder of the tests.

SEMEN EXAMINATION

Following is a brief description of the tests used in examining semen.

1) *Appearance.*—Good semen is opaque-white, slightly turbid, with no discoloration. Pus, blood, or urine will tend to make it yellowish in color, blood-tinged, or quite watery.

2) *Quantity.*—The average bull will ejaculate from 3 to 15 cc., with an average of about 5 cc. When less than 3 cc. are collected, it is a good practice to collect another ejaculate.

3) *Motility.*—Initial motility, or rate of movement, of the sperm is observed microscopically. This test should be made as soon as possible after the semen is collected. A clean warm slide should be used. A drop of semen should be placed on the slide and spread. With the low power objective of the microscope, different areas of the smear may be observed to ascertain both mass movement and individual sperm movement. The following system is used to grade motility:

90 per cent—Excellent motility: swirls and eddies are rapid—movement so vigorous it is impossible to observe individual sperm.

80 per cent—Very good motility: same as above but not so rapid.

70 per cent—Good motility: 70 to 80 per cent of sperm are vigorous and show rapid motion. Waves are very slow.

60 per cent—Fair motility: 60 per cent of sperm active—mass movement barely visible.

50 per cent—Poor motility: 50 per cent of individual sperm are active—no mass movement.

40 per cent—Unfit to use: motion weak—movement is oscillatory, not progressive.

4) *Acid-Base Concentration.*—Investigators have found that the pH of bovine semen averages 6.74. The range of pH commonly found in bull studs varies from 5.8 to 6.9. The method of collecting the semen may affect its pH. Urine and filth from the sheath will change the normal reading. For field or laboratory use, the portable Coleman pH meter may be used. There are many different types of solutions and papers that, while not so accurate as the meter, do give a rough estimate. Nitrazine paper is commonly used. Only undiluted semen should be tested.

Recent research has shown that the amount of pH drop that takes place in a sample of semen incubated one hour at 37 C. is directly correlated to the motility, concentration, and metabolic rate of the semen sample. In the future, when more is known concerning this relatively simple test, semen probably will be judged for quality merely by incubating and checking the amount of pH drop. As yet, no standards have been definitely set up to compare the amount of pH drop to longevity obtained by refrigeration.

5) *Methylene Blue Reduction Test.*—Active sperm will utilize more oxygen than inactive sperm; the result being the liberation of hydrogen, which combines with the methylene blue to form leucomethylene blue. Fifty milligrams of methylene blue in 100 cc. of citrate buffer will make the stock solution. Dilute 0.2 cc. of semen with 0.8 cc. citrate buffer (dilution 1:4). Add to this, 0.1 cc. of methylene blue solution and mix; seal with ½ in. of mineral oil; place in hot water bath 110 to 112 F., and time. Good semen will lose color in three to five minutes.

6) *Enumeration of Spermatozoa.*—Normal bull semen will range from a few hundred thousand to more than 2 million sperm per cubic centimeter, with an average of about 1 million per cubic centimeter. To make the count, draw 0.05 cc. of semen into a red blood cell dilution pipette and fill to the 1.01 mark with a diluent, usually physiologic saline. Place on cytometer slide, cover, and count five large double-ruled squares, if using the Neubauer ruled counting chamber. The number of sperm counted multiplied by 10,000 will equal sperm concentration per cubic millimeter of semen.

7) *Morphology.*—High quality semen should not have more than 5 to 15 per cent abnormal sperm, which includes broken tails, loose heads, crooked tails, and abnormalities in tail piece. Stain two or three drops of diluted semen on a clean slide with a stain of 1 Gm. of eosin Y to 100 cc. distilled H_2O. Count 100 sperm in different fields. The number of abnormalities may then be figured in per cent.

8) *Alive-Dead Stain.*—A high percentage of live sperm is necessary for good quality semen. By means of a differential stain, the live sperm can be identified from the dead sperm. Two grams of fast green and 0.8 Gm. of eosin B to 100 cc. of citrate buffer will make the differential stain. The dead sperm will stain dark and the live sperm will stain light. More than 35 per cent dead sperm would indicate a sample of fresh semen of very poor quality.

9) *Longevity.*—Good quality semen has the ability to live for several days under refrigeration. Some investigators have

kept semen under refrigeration for sixty days, with a motility of around 5 per cent. Of course, such a sample could not be used for insemination. However, the practical duration is four to five days, with a motility of more than 50 per cent. In general, it is thought the higher the quality of sperm, the greater its longevity. This fact can be determined by keeping the semen under refrigeration at 34 to 37 F. and checking motility daily. Some investigators have found that ten days of refrigeration at 5 C. is equal to sixty minutes in a water bath of 46.5 C. Longevity can be figured in a short time by the use of the incubation method.

10) *Bacterial Counts.*—Bulls of questionable fertility should be examined for bacteria in the genital tract. The semen may be plated on blood agar plates. Large numbers of bacteria will cause sterility. Some of the types of bacteria found in the genital tract of bulls are Pseudomonas, pyocyaneus, streptococci, *Br. abortus*, micrococci, Proteus, and coliform groups. The veterinarian may find it impossible to conduct some of these tests because of the lack of equipment or facilities.

DISCUSSION

Motility, quantity, pH, and appearance tests, which may be conducted with a minimum of difficulty, often will determine a bull's usefulness. Other tests may be used to supplement these if they are questionable.

Extreme caution must be taken in handling sperm to prevent temperature shock. The preferred method is to check motility and pH on the farm, then refrigerate the sample and conduct the remainder of the tests in the laboratory. Part of the sample may be diluted with an egg yolk citrate diluent, which is prepared by the addition of 3.4 Gm. of sodium citrate to 100 cc. of distilled water, to which combination is added an equal amount of egg yolk. The semen may be diluted 1 part semen to 4 parts diluent.

By the use of these tests, the fertility of the bull can be estimated. An attempt to evaluate these tests in order of importance is difficult. Collectively, with a clinical examination, they may be used with reasonable assurance that a bull's fertility can be accurately estimated. It must be remembered that pregnancy is the only positive test of a bull's fertility.

SUMMARY

Tests to determine fertility in the bull:

1) A thorough physical examination.

2) Tests for brucellosis, trichomoniasis, *Vibrio foetus*.

3) Semen tests:

a. On farm—appearance, motility, pH, quantity.

b. In laboratory—methylene blue reduction, longevity, bacterial counts, morphology, sperm count.

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Instrument for Collecting Fertilized Ova

An instrument is described by L. E. Rowson and D. F. Dowling (*Vet. Rec., 61*, Apr. 9, 1949) for collecting fertilized ova from living cows. Briefly, it consists of a rubber tube 30 in. long which has three channels. Two of the channels serve as a two-way catheter. A collar that fits over the tip of the uterine horn is inflated by pumping air through the third channel with a record syringe. When the instrument is in proper position, suitable fluid can be flushed through the two-way catheter and used for washing out and collecting the fertilized ova. The instrument is available from Arnold & Son, 54 Wigmore St., London.

Swine production records indicate that number and placement of mammae are transmissible characters. The dam of the herd boar should have at least 12 sharp, well-defined, properly spaced teats; and these should also appear on the boar so that he may transmit them to his female progeny.—*Country Gentleman. Dec.*, 1948.

The healthy bovine uterus, whether gravid or nongravid, is bacteria-free.—*Canad. J. Comp. Med., Apr.*, 1949.

Surgical Technique to Establish Drainage of the External Ear Canal and Corrections of Hematoma of the Dog and Cat

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AN OPERATION to correct or alleviate certain ear diseases of the dog or cat, by establishing drainage at the apex of the external ear canal, has been described by Formston and McCunn.[1] It involves removal of a V-shaped section of the tissues forming the lateral wall of the external ear canal to establish the drainage. There are a number of objections to this operation.

Removal of a V-shaped section of the lateral wall of the ear canal to establish drainage, involves removal of the tissues lateral to the conchal cartilage which includes the major part of the parotid salivary gland. Also, when removing these tissues, the surgeon may sever the superficial temporal vein or facial nerve which emerges from the skull just posterior to the apex of the external ear canal and passes as a main trunk over the lower lateral area of the conchal cartilage of the external ear canal. If the facial nerve is severed, facial paralysis will result, which is unsatisfactory for cosmetic reasons.

Another objection to the V-shaped operation, especially in old fat dogs, is that during the process of healing the meatus leading to the inner ear is partially, and in some cases completely, closed by the contraction and granulation of the tissues. This defeats the purpose of the operation, which is to establish drainage. In some cases, granulation and contraction reëstablish a partial canal. Hair over the meatus becomes unsanitary because of the accumulated discharge.

To prevent these faults, I have devised a plastic procedure of deflecting and grafting a section of the lateral conchal cartilage and tissues of the external ear canal ventral to the meatus. By this method, the dangers and unsatisfactory results mentioned are overcome because the tissues, except skin, are not disturbed. The deflected, grafted section of the cartilage prevents the granulating and contracting tissue from closing the meatus or reëstablishing a partial external ear canal. Also, the deflected, grafted section of cartilage serves as a drainboard for ear discharges. No hair will grow over the deflected cartilage, thus keeping the ear more sanitary.

By this method, the drainage of diseased ears can be established by either complete or partial resection and grafting ventrally the lateral tissues, except skin, of the external ear canal. The type of operation to perform on each particular case must be determined by the clinician. His decision is based on the diseased condition of the ear and the cosmetic effect following the operation.

I recommend the complete resection and ventral graft for all dropped ear-flap dogs suffering with chronic otitis externa complicated by hypertrophy of the canal membranes, and in all cases of fibrosing and granulating (tumorous) membranes. The complete resection and ventral graft should be done on dogs with standing ears suffering with the above-mentioned diseased condition, since the partial resection and graft only establishes drainage and does not alleviate the diseased canal.

The partial resection and ventral graft will establish drainage in cases of uncomplicated ruptured tympanum (drum); however, the partial operation should be performed only in cases in which the complete resection would interfere with the ear carriage or be unsightly.

PREPARATION OF THE SURGICAL FIELD

To describe the preparation of the surgical field for an operation may sound superfluous in this day of advanced veterinary science, but since the region of the ear and ear canal are areas difficult to sterilize and usually badly infected with pyogenic bacteria, and because aseptic conditions are so necessary for good healing of the graft, a review of the preparation is in order.

Preparations should be made at least six or eight hours, and preferably a full day, before the surgery to assure relatively aseptic conditions. The following is the recommended preparation: Clip the hair from the area and from the external ear flap, since it is often necessary to handle this part while operating; remove the hair from the ear canal; wash and scrub thoroughly the area including the external flap and ear canal with soap and water,

[1]Formston, C., and McCunn, J.: A Surgical Treatment for Chronic Otorrhoea in the Dog. Vet. J., *87*, (1931):112.

dry, and rub 5 per cent sulfathiazole cream thoroughly into the skin; then apply a sterile dressing held in place by a head bandage. This dressing is not removed until the time of the operation. After anesthesia is effective, remove the dressings and again clean the area with alcohol. This preparation, done carefully, should produce a near-sterile field. However, to make sure of good healing, sprinkle sulfanilimide granules into the wound before suturing.

The following are the principal steps for the surgical procedure:

1) Remove the skin from the lateral surface of the ear canal; also, remove the skin ventral to the meatus, an area slightly larger than the section of cartilage to be grafted ventrally. Do not remove the subcutaneous tissue with the skin.

2) Completely resect a dorsolateral V-shaped section of the lateral conchal cartilage, about 1/4 to 1/3 the depth of the ear canal. The removal of this section will not interfere with the parotid gland or blood and nerve supply to the face.

3) The lateral wall of the conchal cartilage ventral to the V-shaped resection is freed half the distance to the apex by incisions directed anteriorly and posteriorly at about a 25 degree angle. In freeing this section of cartilage, I use double-pointed scissors, placing one point in the external ear canal and using the other to undermine the tissues lateral to the conchal cartilage, thus not interfering with the parotid gland or facial nerve.

Following the described procedure, by changing the angle of the scissors directed toward the meatus, the incisions are continued down and through the annular ligament. This will allow, in most cases, free deflection of the conchal cartilage and lateral tissues. In some dogs, it may be necessary to cut the dorsal border of the parotid gland anteriorly and posteriorly to obtain free deflection of the section to be grafted ventrally.

4) Carrying out the principles of graft surgery, the deflected section of conchal cartilage and lateral tissues are grafted to the area from which the skin had been removed, ventral to the meatus. This is accomplished by placing three interrupted No. 1, 20-day catgut sutures, the first of which joins the subcutaneous tissue at the apex of the section to be deflected to the ventral angle of the primary skin incision. The other two sutures are placed anterior and posterior to firmly fix the deflected section of cartilage.

The skin is sutured to the ear membrane by interrupted silk sutures, taking care not to include the cartilage. Anterior and posterior to the meatus, because of the deflection of the cartilage, there will be a small triangular area not covered by cartilage. At these points, suture the skin to the subcutaneous tissue. This is important to prevent excessive granulation.

Dress the surgical wound with a free application of sulfathiazole powder to prevent infection, and fix the external ear flap back over the head with adhesive tape to prevent contraction while healing.

Administer small doses of barbiturates for a few days after the operation to keep the animal comfortable and to prevent excessive shaking of the head and scratching of the wound.

Remove the stitches in about two weeks.

Facts About Artificial Insemination

With respect to universal adoption by breeders, artificial insemination of dairy cattle has made the most rapid strides of any development to date for the improvement of livestock. The first artificial breeding association in the United States was organized in New Jersey and began operations in May, 1938. Ten years later (Jan. 1, 1948), there were 963 associations throughout the nation, with 224,493 herds enrolled, totaling 1,743,327 cows.

In 1939, there were 228 cows enrolled per bull kept in association studs; in 1948, due to greater dilution of the semen and greater volume of cows to be inseminated, 1 bull was kept for each 999 cows. About 24 per cent of the sires used in this work are proved, and their daughters give an average of 433 lb. of butterfat as compared with 407 lb. for their dams.

Artificial breeding will not entirely replace herd sires on the larger dairy farms, but it will extend their use. Cost per artificial service ranges from $5.00 to $7.50. Local organizations are rapidly giving way to central or federated types, where a central stud supplies semen to 12 or even 100 local units.

The insemination association must settle cows with a high degree of efficiency if it is to succeed. Efficient operation can result in 60 per cent of the cows settling the first service. In the case of persistent non-settlers, the cause should be determined, and if veterinary attention is the answer, it should be provided.—*H. A. Herman, Guernsey Breeders' J., May* 1, 1949.

For each dozen eggs produced by a flock, approximately 9 lb. of water is required, including body needs.—*World's Poult. Sci. J., Jan.-March,* 1949.

CLINICAL DATA

Clinical Notes

X-ray therapy is indicated in at least 50 per cent of the cancer cases in dogs.—*Myron Thom, D.V.M., California.*

There are 53 drugs in the National Formulary derived from animals sacrificed for the benefit of the human being.

Over 50,000 Michigan dairy animals have now been vaccinated with Brucella M vaccine, according to a Michigan State College news release.

"Bullnose" in baby pigs often responds to sulfapyridine at the rate of 1 Gm. per pound of weight, intraperitoneally. If necessary, this is repeated in forty-eight hours. —*C. A. Lemon, D.V.M., Illinois.*

In experiments on sodium barbital-anesthetized dogs at West Virginia University, the mean systemic blood pressure of males was 9 mm. Hg higher than that of females. —*Science, May* 13, 1949.

Cesarean section in the sow is successful when used early, but seldom is good surgical practice after the sow has been parturient for a long time.—*H. C. H. Kernkamp, D.V.M., Minnesota.*

New Dehorning Caustic.—The USDA Regional Animal Disease Laboratory, Auburn, Ala., has announced a "better" dehorning material composed of antimony trichloride, 28 per cent; salicylic acid, 7 per cent; and flexible collodion, U.S.P., 65 per cent.

Curare.—The importance attached to the use of curare in human medicine was revealed at the Atlantic City session of the American Medical Association. Five of 13 papers listed on the program of the Section on Anesthesiology were devoted to the use of that relaxant.

Chaulmoogra Oil.—The use of chaulmoogra oil with reportedly good results in urinary tuberculosis (human) (*Tuberc. Index,* March, 1949) recalls interesting effects obtained from its use in the early stage of follicular mange in dogs and, of course, of its age-old use in leprosy.

One to 3 per cent of all hogs in the United States are infected with brucellosis.—*L. M. Hutchings, D.V.M., Indiana.*

Pyemic arthritis in pigs up to 3 weeks of age is often caused by streptococci, but enlarged joints in older pigs are more often caused by chronic swine erysipelas.

Beaver Farming.—A Canadian fur farmer is making the first known attempt to raise beavers in captivity, but several years will be required to determine its unknown family life.

The best field-cured alfalfa does not provide vitamin D to poultry as it does to herbivores. The only reliable sources of vitamin D for birds are solar light and fish oils.

Trials with various commercial estrogen pellets for poultry have revealed a wide variation in efficacy, according to a research progress report of the University of California.

Clinician's Question No. 1

Since time far beyond the memory of living veterinarians, the first questions asked in the presence of the sick concerned the feed recently consumed or habitually fed. That has been a leading inquest since Moses left Goshen and, in so far as history may be trusted, there has been no change up to A.D. 1949. Yet, coming upon the operations of veterinary science for the first time, animal nutritionists, especially experts of the rapidly developing stock feed industry, feed called upon to inform us that "veterinarians are becoming concerned about the relationship of feed and disease." Well-meaning grown-ups who come upon the carbohydrate-protein-fat-mineral-vitamin chain and the interrelations and complexities of its links may not be aware that knowledge of these is a freshman study that is never deserted in the field of practice. It is a first in the college and a first in the stable. The happy side is that veterinary medicine is getting inspected.

Blood Factors and Baby Pig Anemia

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DIMOCK, Edwards, and Bruner[1] suggested that certain cases of icterus in newborn foals indicated a condition similar to erythroblastosis foetalis in human infants. In 1948, Bruner, Hull, Edwards, and Doll[2] and Bruner, Hull, and Doll[3] showed that cases of hemolytic icterus in newborn foals occurred when mares sensitized to certain types of erythrocytes were bred to stallions which transmitted that type of blood cell to their offspring. The icteric condition developed in an apparently normal foal after it had obtained the specific erythrocyte-destroying antibodies from the dam's milk. That these antibodies were transferred through the colostrum was shown by Bruner, Edwards, and Doll.[4] Schneider and Szathmary[5] indicated that the pig falls in the same category as the horse in so far as the transfer of passive immunity to the offspring is concerned. It appeared that some cases of anemia in baby pigs might be due to the action of blood factors, and this paper is a preliminary report on the experimental production of baby pig anemia through the mechanism of an antigen-antibody reaction between the erythrocytes of the newborn pig and the antibodies of the sensitized sow.

EXPERIMENTAL

Blood samples were obtained from 5 pregnant gilts and from the boar to which they were bred. The samples were tested for isoagglutinins and isohemolysins according to the procedure outlined by Bruner, Hull, and Doll.[3] These hogs were negative to the brucellosis agglutination test and were vaccinated for hog cholera with crystal violet vaccine. Three of the pregnant sows were immunized against the erythrocytes of the boar which bred them. They were given three intravenous injections of 10 cc. each of citrated boar's blood at seven day intervals, followed by one subcutaneous injection of 20 cc. each at the end of the fourth week. These injections were begun about six weeks before the gilts were due to farrow. All of the experimental pigs were fed adequate rations and quartered on a dirt floor.

RESULTS

Cross-matching tests with blood specimens from the 5 gilts and the boar showed no agglutination when red cell suspensions were brought into contact (plate tests) with serums diluted 1:2 in physiologic saline. When undiluted serums were used, slight reactions occurred in some of the tests. None of the serums was able to produce hemolysis in tube tests. Immunization of 3 of the pregnant gilts against the boar's erythrocytes resulted in the production of hemagglutinins and hemolysins. The antibody titers developed are given below.

Gilt 1.—This gilt was not injected with an erythrocyte suspension of the boar's blood. It farrowed 9 apparently normal pigs. Red cell counts made on these pigs the day they were born averaged 5 million per cubic millimeter of blood. Neither the blood nor the milk of the parturient gilt showed any demonstrable hemagglutinins for the erythrocytes of the test boar. Two days later, the red cell counts on these 9 pigs ranged from 4 to 6 million per cubic millimeter, and the pigs appeared healthy and normal. Two weeks after birth, all the pigs in this litter showed erythrocyte counts over 4 million per cubic millimeter and were making rapid gains in growth.

Gilt 2.—Gilt 2 was immunized against the erythrocytes of the test boar. This pregnant gilt developed hemagglutinin and hemolysin titers of 1:8 and 1:10, respectively. It farrowed 8 pigs one day later than gilt 1. These newborn pigs were bled before they nursed, and their red cell counts ranged from 5 to 7 million per cubic millimeter. Six of these baby pigs appeared normal, but the other 2 were weak and died within an hour after birth. The blood specimens from all 8 pigs appeared to be normal, and none showed demonstrable hemagglutinins for the boar's erythrocytes. It was shown that the 8 pigs all belonged to blood types similar to that of the boar. None resembled the blood type of the sow. The 6 remaining pigs were allowed to nurse, and within twenty hours the first one was dead. Its red cell count

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was less than 1 million per cubic millimeter, and its serum now contained hemagglutinins for the boar's cells. In less than forty-two hours, all members of the litter were dead. Three of the baby pigs which were bled when moribund showed red cell counts of less than 1 million per cubic millimeter and hemagglutinin titers of 1:4. Although no milk was obtained from this sow until twenty-four hours after the pigs were born and had nursed, it then showed a titer of 1:32 against the boars erythrocytes. At the time the milk was tested, only 1 live pig remained in litter 2, and 4 baby pigs of litter 1 were moved to sow 2. These pigs were 2 days old and, together with the day-old pig, made a litter of 5. Within forty-two hours after birth, the last survivor of litter 2 died, but the 4 foster pigs which were nursing sow 2 did not develop anemia even though the sows serum strongly agglutinated their erythrocytes *in vitro*. The milk of sow 2 presented a hemagglutinin titer of 1:32 at the time the foster pigs started to nurse, and this titer dropped to less than 1:4 within forty-eight hours. There was no evidence, however, that the 2-day-old pigs absorbed any of the agglutinins, since their blood samples showed no changes, according to our tests, except that their red cell counts dropped to 2 to 4 million per cubic millimeter. Red blood cell counts on their litter mates which had remained with the nonimmunized sow gave similar figures.

Gilt 3.—This gilt also was injected with erythrocytes from the test boar. It developed hemagglutinin and hemolysin titers of 1:64 and 1:10. It farrowed 6 pigs three days after the litter of gilt 2 was produced. The 6 members of litter 3 apparently were normal at birth. Their red blood cell counts all were above 5 million per cubic millimeter, and there was no evidence that they carried hemagglutinins in their serums. Cross-matching tests showed that the red blood cells of all 6 pigs were similar to those of the boar. Within less than twelve hours, the red cell counts on these newborn pigs were less than 3 million per cubic millimeter, and hemagglutinin titers of 1:4 to 1:8 were present. The pigs appeared listless, weak, and showed no desire to nurse. In less than twenty-eight hours, all were dead. On postmortem examination, they showed extreme anemia; in fact, it hardly was possible to find any red blood cells. Urine specimens of these pigs were red-tinged.

Gilt 4.—This animal likewise was immunized against the erythrocytes of the test boar. It developed hemagglutinin and hemolysin titers of 1:32 and 1:100. The first 3 gilts to farrow did so on the 115th day of gestation. Gilt 4 farrowed 7 pigs on the 113th day of gestation. The gilt was not under observation for twelve hours on the 113th day of gestation and, during that interval, it gave birth to the 7 pigs. When gilt 4 was observed at the end of the twelve hours, all of the baby pigs were dead. Milk from the sow presented a hemagglutinin titer of 1:64. Postmortem examinations on the 7 dead baby pigs indicated that they were born alive some hours before death occurred. Their navel cords were well dried, stomachs were full of milk, and lungs were expanded. Whey samples taken from the milk in the stomachs of 2 of these pigs showed agglutinin titers of 1:128. The pigs were markedly anemic and carried serum hemagglutinin titers of 1:2 to 1:8. Bacteriologic cultures inoculated from the 7 pigs were negative.

Gilt 5.—This sow was not injected with the test boar's erythrocytes. It is not due to farrow at this writing.

DISCUSSION

Young,[6] in his discussion of baby pig disease, lists a number of conditions which may be contributing factors. He states that an inadequate diet for the gestating sow usually is considered to be responsible; however, his observations tend to discredit the concept that baby pig disease is basically one of faulty nutrition. Furthermore, he presented the hypothesis that baby pig disease is, in reality, one of reverse anaphylactic shock—the pig being sensitized *in utero* and the antibody concentrated in the colostrum. He used hog-cholera virus as a possible agent in producing the disease and obtained a mild sort of baby-pig-like disease.

The baby pig anemia that we produced definitely was an antigen-antibody reaction, but not in the nature of an anaphylactic shock. It is possible that the injection of hog-cholera virus made from whole blood might sensitize a pregnant sow and cause her to produce anemic pigs. To do so, the erythrocytes of the offspring would have to be a type that would react with the serum of the sensitized sow. Accordingly, the number of anemic pigs produced would depend entirely on the presence of the correct blood type in the newborn pig.

As mentioned previously, all 14 pigs of litters 2 and 3 carried erythrocytes similar to those of the boar and unlike those of the sows. It was shown by Bruner, Hull, and Doll[3] that a foal produced by a sensitized dam will not develop hemolytic icterus if the foal's red cells are like those of its dam. These 14 pigs that inherited the boar's type of erythrocytes died. Unfortunately, in

the 2 litters it was not possible to study a group whose members were divided in their blood types between those of the sow and those of the boar. By comparison with the horse, any baby pig that possessed the sow's blood type should have lived.

The normal baby pigs of litter 1 which were placed with gilt 2 survived. Although gilt 2 had lost its litter due to severe anemia and carried antibodies in its milk for the erythrocytes of the 4 foster baby pigs, no deaths occurred. Studies with newborn foals have indicated that they do not absorb antibodies in detectable amounts from the alimentary tract after the first day of life.[7] Tests made with blood samples of the foster pigs that had nursed gilt 2 indicated that no antibodies were absorbed from the milk.

A comparison of the hemagglutinin and hemolysin titers of the 3 immunized sows showed the following: gilt 2, 1:8 and 1:10; gilt 3, 1:64 and 1:10; gilt 4, 1:32 and 1:100. All members of litter 2 were dead within forty-two hours; members of litter 3 within twenty-eight hours; and members of litter 4 within less than twelve hours following birth. It is known that all the pigs of litter 4 were born, nursed, and died within a twelve-hour period. The rapidity of the onset and the severity of hemolytic icterus in the newborn foal appear to be directly related to the hemolysin titer. It will be noted that gilt 4 had a hemolysin titer 10 times as strong as those of gilts 2 and 3.

As stated in the introduction, this is a preliminary report on the production of anemia in baby pigs, and the results given are based on laboratory findings. Whether certain types of so-called baby pig anemia or baby pig disease which appear in field cases are due to blood factors remains to be established. It appears likely that blood factors can cause losses of baby pigs. Furthermore, it is possible that blood factors play an important role in similar diseases of newborn calves and lambs.

SUMMARY

Anemia and death occurred in baby pigs when the gestating sow was injected with the erythrocytes of the boar to which it was bred. The disease appeared in apparently healthy newborn pigs after they obtained the specific erythrocyte-destroying antibodies from the sow's colostrum. Normal 2-day-old pigs which were allowed to nurse a sensitized sow did not absorb hemagglutinins even though they lowered the sow's milk titer for these antibodies from 1:32 to 1:4. Although it was shown that blood factors are involved in producing experimental anemia in baby pigs, its importance in field cases remains to be established.

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Q Fever.—The rickettsial, influenza-like disease, known as Q fever, is not an animal ailment. Cattle, sheep, and hogs serve as reservoirs for the organism but it does not infect them. Livestock and packing-house workers are those mostly infected.

Multiple Vaccines

The use of double or triple vaccines in veterinary medicine on economic grounds where science approves is again discussed in an article by Ch. Merieux (*Rev. Path. Comp.*, Jan., 1949). The triple vaccine of G. Ramon—diphtheria-tetanus-pertussis—or similar combinations of pathogens of domestic animals having synergistic antigens would have the economic advantages of a single round-up for large herds. The author suggests combinations of brucellosis, blackleg, and/or anthrax as one example of associated vaccines to be considered in veterinary medicine. And, not to be forgotten is the sheep pox-anthrax vaccine that was preconized, developed, and widely used in Iran* where sheepmen were loathe to submit their flocks to more than one treatment.

To the laboratorians belongs the task of producing associated vaccines without tampering with the antigenic power of the ingredients. The mere mixing of them does not interfere with the immunizing ability for each disease represented.

*Delpy and Chamey of the Institute of Hessararak (Iran) announced to the French Academy of Science that the antigens of ovine variola and of the anthrax bacillus had been successfully processed into an effective, single dose vaccine for both diseases (*see Compt. rend. Acad. Sci.*, 1947).

Plasma Penicillin Concentrations Following a Single Intramuscular Injection of Repository Dosage Forms in Dogs

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AQUEOUS solutions of the sodium or calcium salt of penicillin often are injected intramuscularly for the treatment of infection. The rapid excretion of this antibiotic agent from the body necessitates the repetition of this procedure at frequent intervals in order to obtain a satisfactory therapeutic effect. In contrast, repository dosage forms of penicillin are injected at widely spaced intervals. In such preparations, the crystalline antibiotic agent is mixed with a suspending vehicle and is introduced into the muscle tissue as solid penicillin. As the antibiotic agent slowly dissolves in the body fluids, it is absorbed into the blood stream, thus producing significant plasma penicillin levels for prolonged periods. The efficiency of these dosage forms is determined not only by the nature of the suspending vehicle, but also by the characteristics of the penicillin used in the mixtures.

The first of these preparations to be used widely was a suspension of 300,000 units of sodium or potassium penicillin in 1 cc. of a mixture of oil and beeswax.[1,2] Although such preparations did prolong the concentration of penicillin in the plasma, occasional abscess formation and induration resulted from the deposition of beeswax in the muscle or subcutaneous tissues. The procaine salt of penicillin has proved to be more insoluble than is the sodium or potassium salt; it has been suspended either in oil[3] or in water[4] and used to produce prolongation of the plasma penicillin level.

TABLE I—Effect of Dosage Form on Average Plasma Penicillin Concentrations in Dogs Following a Single Intramuscular Injection (1.0 cc.) of 300,000 Units of Penicillin

Dosage		Units penicillin per cc. plasma									
		Sampling time in hours after injection									
Penicillin salt 300,000 U.	Suspending vehicle	1	8	24	48	72	96	120	144	168	192
Sodium	water*	19	0.05	0.01	.....	.....	.....	.....	.....	.....	.....
		(7)**	(7)	(7)	.....	.....	.....	.....	.....	.....	.....
Sodium	oil-beeswax	15	0.31	0.04	.....	.....	.....	.....	.....	.....	.....
		(2)	(2)	(2)	.....	.....	.....	.....	.....	.....	.....
Procaine	water	3.3	1.8	1.6	.....	0.02	.....	.....	.....	.....	.....
		(10)	(10)	(10)	.....	(10)	.....	.....	.....	.....	.....
Procaine	oil	3.8	1.7	0.57	0.07	0.04	.....	.....	.....	.....	.....
		(5)	(5)	(7)	(7)	(7)	.....	.....	.....	.....	.....
Procaine	oil-2% Al monostearate	1.2*	0.79	0.59	0.45	0.34	0.04	0.12	0.12	0.04	0.01
		(9)	(9)	(9)	(9)	(9)	(8)	(4)	(4)	(4)	(4)

*Solution.
**Figures in parentheses indicate number of values averaged.

During the course of a research program, a number of such dosage forms were given as a single, intramuscular injection of 300,000 units of penicillin to dogs weighing approximately 15 kg. At stated intervals following this injection, blood samples were withdrawn from the femoral vein and the plasma was assayed for penicillin by a modification of the Rammelkamp tube dilution assay method.[5,6] For purposes of arithmetic averaging, penicillin concentrations that could not be detected by this method were considered to be zero values. In addition to the types of preparation already mentioned, a dosage form consisting of procaine penicillin suspended in oil and gelled with 2 per cent aluminum monostearate, and the nonrepository dosage form of sodium penicillin in aqueous solution were tested. Considerable information showing the relative ability of these preparations to prolong detectable plasma penicillin concentrations in dogs

From the Medical Research Division, Sharp and Dohme, Inc., Glenolden, Pa.

was accumulated during this survey. Doll and his associates[7-11] have reported on plasma concentrations in the blood following the injection of different dosage forms into horses, sheep, and cattle. Brinker[12] and Bratt *et al.*[13] include plasma penicillin concentrations in their studies on dogs. However, comparable data in the dog with the dosage forms used in these studies does not seem to be available in veterinary literature. A summary of our results is given in table 1.

It will be seen that the average plasma penicillin concentrations following the injection of 300,000 units of sodium penicillin in aqueous solution dropped rapidly from a value of 19 units per cubic centimeter of plasma at one hour, when all 7 dogs showed detectable penicillin levels, to a value of 0.01 unit twenty-four hours after treatment, at which time the plasma samples of only 3 dogs showed detectable penicillin. Beeswax and peanut oil suspensions of sodium penicillin were injected into only 2 dogs, but the average values given in the table are indicative of results that might be predicted on the basis of human data available in the literature.[1] Suspensions of procaine penicillin in oil or in water did not cause as high an initial plasma penicillin concentration as did the oil-beeswax preparation, but their effect was prolonged over a greater period than was the case for the first two preparations tabulated. An even greater prolongation of plasma penicillin level followed the injection of procaine penicillin suspended in peanut oil and 2 per cent aluminum monostearate. Three of the 4 dogs sampled eight days, and 1 of 4 dogs tested nine days after the treatment showed detectable penicillin in the plasma. These results show that the effectiveness of repository dosage forms of penicillin to prolong the time during which this antibiotic agent may be detected in the plasma of dogs following a single intramuscular injection, is of the same relative order as that reported from clinical trials of similar preparations given to human patients.

SUMMARY

Preparations of 300,000 units of penicillin as sodium penicillin in aqueous solution, sodium penicillin suspended in beeswax and oil, and procaine penicillin suspended, respectively, in oil, in water, and in oil-aluminum monostearate were injected intramuscularly into dogs. Average concentrations of penicillin in the plasma following these injections are reported. The oil-aluminum monostearate suspension of procaine penicillin produced the greatest prolongation of penicillin in the plasma of any of the preparations that were tested.

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Harmful Action of DDT Denied

Widely published reports to the effect that DDT sprayings are responsible for virus X disease of man and X disease of cattle was categorically denied by the USDA after close investigations by the bureaus of animal industry, entomology and plant quarantine, insecticide division, and other agencies including the Medical Department of the Army, U. S. Public Health Service, and Food and Drug Administration.—*Feedstuffs, April* 16, 1949.

Reliability of Erysipelothrix Rhusiopathiae

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IMMUNIZATION against swine erysipelas has become a common practice in the swine-raising areas of the Middle West. The procedure involves the use of an *Erysipelothrix rhusiopathiae* antiserum, prepared by immunizing horses, and a virulent vaccine (composed of a broth culture of live *Ery. rhusiopathiae*). These materials are injected simultaneously into swine to induce active immunity against swine erysipelas.

The simultaneous use of live culture and specific antiserum for immunization against erysipelas is not new; it was developed more than fifty years ago in France and Germany by Lorenz and Leclainche (Van Es and McGrath[1]). Lorenz suggested the injection of serum and culture separately into different parts of the body at the same time, and Leclainche recommended mixing of culture and serum immediately prior to a single injection. These methods have been widely used in European countries since their development. From 1930 to 1936, the acute septicemic form of swine erysipelas was recognized in various parts of this country, and 24 per cent of 281 outbreaks of acute swine disease in Nebraska were found to be swine erysipelas.[1] During this time, only an antiserum was available for combating the infection. The manufacture and use of a live culture vaccine was not permitted.

In 1938, live culture vaccines were prepared at the Nebraska Agricultural Experiment Station. A coöperative project was developed with the U.S. and Nebraska bureaus of animal industry, and practicing veterinarians selected for a field trial of the Lorenz method of immunization against swine erysipelas.[2] As the project developed, production of vaccine was taken over by a U.S. Bureau of Animal Industry laboratory in Nebraska and, later, by commercial producers.*

Much work was done in standardizing the immune serum[3] and toward development of a standardized live culture to be used as a vaccine. Many of the failures of attempts at prophylaxis by this means were attributed to deficiency of either the serum or vaccine. The commercial producers of these two biological products have been licensed and supervised by the U.S. BAI. In 1940 and 1941, an effective set of standards and tests for the control of swine erysipelas antiserum was issued by the BAI to the licensed producers. Prior to this time, wide variation in potency of commercially prepared swine erysipelas antiserums had been noted.[3] The antiserum product is relatively more stable and less subject to deterioration than the live culture vaccine.

TABLE I—Summary of Tests of Erysipelothrix Rhusiopathiae Vaccines at Their Expiration Dates. Acceptability Based on Virulence for Pigeons. Samples from Seven Commercial Producers

Year	Tested (No.)	Acceptable (%)	Not acceptable (%)
1942	91	68	32
1943	141	52	48
1944	92	83	17
1945	71	73	27
1946	37	84	16
1947	29	69	31

Details for the production of *Ery. rhusiopathiae* vaccine are set forth in specific instructions by the U.S. BAI. Each lot of commercially produced erysipelas vaccine is withheld from distribution until it has satisfactorily passed standard tests applied by the U.S. BAI. The standard test for virulence is made from a pooled sample and stated as follows: "0.5 cc. should be injected into 2 pigeons intramuscularly or 0.1 cc. into 3 mice subcutaneously, all of which should succumb within seven days."[4] The first commercially prepared vaccines were allowed to be used up to sixty days from the date harvested. Since some were found to have lost their virulence at sixty days, the period was reduced, in 1944, to forty days in an attempt to make the product more reliable.

The occasional failure of the simultaneous serum and culture method of prophy-

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*During this pioneering stage, credit is due to the following representatives of the U.S. BAI: Drs. J. E. Peterman and A. G. Beagle, for field work, and C. G. Grey who took over production of vaccine.

laxis leads to speculation about the reason for such failure. The tests applied by the U.S. BAI are made on these products prior to their release for distribution, and they should, therefore, be good at the time of release for sale. No routine tests are made by the U.S. BAI at the time of the expiration date. The purpose of this report is to present the results of testing *Ery. rhusiopathiae* vaccines at the end of the expiration period. The tests were made on commercial products which had been tested at the time of manufacture and released by government inspection. These observations were made on vaccine manufactured by six producers during a six-year period.

TABLE 2—Summary of Tests of Erysipelothrix Rhusiopathiae Vaccines at Their Expiration Dates. Acceptability Based on Virulence for Pigeons. Samples Obtained over a Period of Six Years (1942-1947)

Producer	Tested (No.)	Acceptable (%)	Not acceptable (%)
A	75	45	55
B	71	79	21
C	72	69	31
E	66	83	17
F	65	38	62
G*	36	92	8
H	73	82	18

*Four years only.

Methods

The samples of vaccines were obtained from the regular stock of commercial producers. Each manufacturer submitted one sample each month during 1942 through 1945 and for six months, only, in 1946 and 1947. During 1942, 1943, and 1944, duplicate samples were obtained during some of the months for the purpose of making tests at different intervals. The vaccines were issued code numbers* when received and stored at ordinary refrigerator temperature (4 C.) until their expiration dates. Tests were then made for viability and virulence. Viability was ascertained by placing one inoculating needle loopful of the vaccine on the surface of beef heart agar or in beef heart broth medium. If no growth occurred within forty-eight hours, the culture was considered dead. This test also served to reveal contamination of the vaccine, if present. Virulence was tested in pigeons which received 0.25 cc. of vaccine intramuscularly. Four pigeons were used on each test. To be acceptable, a vaccine had to kill, with erysipelas infection, at least 3 of the 4 pigeons within seven days.

One series of special tests was made to compare the reliability of vaccine stored for thirty days with that of vaccine stored for sixty days. For these tests, two samples of the same serial number were obtained from the producers.

Another series of tests was made to compare the effect of storage with respect to container size. Two samples of the same serial number were obtained from each producer, one packaged in a 5-cc. vial and the other in a 15-cc. vial. These were tested on the expiration date.

* This was done to avoid identification of manufacturers. Only the authors know the code.

Results

A wide variation of reliability was found over the six-year period. In many instances, the vaccines contained live bacteria which were not capable of killing pigeons. Except where noted, the data pertain entirely to virulence of the samples and not to viability. Some producers rather consistently manufactured vaccines that were reliable. Vaccines made by other producers were found acceptable at times and nonacceptable at other times.

Improvement of reliability should be expected with the passage of time and the experience gained by the producers. In 1942, 68 per cent of all samples were acceptable, and in 1947, 69 per cent were acceptable (table 1). The figure listed for 1947 may not be a true picture of the actual production, for during that year, all samples of one manufacturer were found nonacceptable. If the samples from this producer were excluded from the calculations, 83 per cent of the vaccines submitted

TABLE 3—Comparison of the Effect of Different Expiration Periods on Acceptability of Erysipelothrix Rhusiopathiae Vaccines. Acceptability Based on Virulence for Pigeons at End of Expiration Period

	*30 days (1942-1944)			*60 days (1942-1944)			40 days (1944-1947)		
Producer	Tested (No.)	Accept. (%)	Not accept. (%)	Tested (No.)	Accept. (%)	Not accept. (%)	Tested (No.)	Accept. (%)	Not accept. (%)
A	16	31	69	16	0	100	30	87	13
B	15	100	0	15	100	0	29	69	31
C	17	53	47	17	41	59	31	94	6
E	9	100	0	9	89	11	30	70	30
F	10	50	50	10	25	75	32	44	56
G	1	100	0	1	100	0	12	83	17
H	16	69	31	16	69	31	33	91	9
Totals	84	65	35	84	52	48	197	76	24

*Tested in pairs having same serial number.

for tests were acceptable. This would make a more creditable showing for the year, though not as good as it should be.

Some producers manufactured a more reliable product than others (table 2). Of the samples manufactured by one producer (G, table 2), 92 per cent were found acceptable. Another producer (F, table 2) submitted samples of which only 38 per cent were acceptable.

The data were examined to study the effect of length of storage on reliability of the products. Direct comparisons were made on products from the same lot of manufacture during 1942 to 1944. The official expiration date for vaccines during this period was sixty days. One sample was tested at thirty days, and a duplicate sample was tested at sixty days. Considerable variation was found. All samples submitted by producers B, E, and G, were acceptable at thirty days, and all but one were acceptable at sixty days (table 3). Producer A submitted 16 samples for direct comparison. Only five (31%) were found acceptable after thirty-days storage, and none were found acceptable at sixty days. Nearly the same number of samples from producers C, F, and H, were acceptable at sixty days as were acceptable at thirty days. A peculiar finding was that two of the total 29 samples found nonacceptable at thirty days were virulent and acceptable in the sample tested at sixty days.

TABLE 4—Results of Tests of Erysipelothrix Rhusiopathiae Vaccines at Their Expiration Period. Acceptability Based on Virulence for Pigeons. Samples Were in Pairs (One 5-cc. and One 15-cc. Vial of the Same Serial Number)

Size vial	Tested (No.)	Acceptable (%)	Not acceptable (%)
5 cc.	11	64	36
15 cc.	11	73	27

The official expiration period was reduced to forty days in 1944, and 76 per cent of the samples submitted subsequently by the different producers were found acceptable (table 3).

A series of tests was made in which different producers submitted duplicate samples in different-sized packages of the same serial lots. One sample was packaged in a 5-cc. vial, and the other sample was packaged in a 15-cc. vial. Eleven pairs of samples were tested. Seven of the 5-cc. vials and eight of the samples in 15-cc. vials were acceptable sixty days after manufacture. A special study was made at expiration date on a group of samples of the same serial number from one producer. Twenty-five 5-cc. vials were tested, and five contained no living bacteria. Forty-eight 15-cc. vials were tested, and all contained viable bacteria. These samples were not tested for virulence. The expiration date of this lot of vaccines was forty days.

DISCUSSION

The results indicate a marked lack of uniformity in the reliability of *Erysipelothrix rhusiopathiae* vaccines produced by the different manufacturers. This variation existed from year to year. The shortening of the expiration period from sixty to forty days did not, in general, lead to a more reliable product. In one series of samples submitted monthly for six consecutive months by one producer, all were found nonacceptable at the end of the forty-day expiration period. It must be borne in mind that these samples were tested and found virulent at the time of manufacture. This test, in which either pigeons or mice were used, was made by the U.S. Bureau of Animal Industry. The official test of the U.S. BAI utilized 0.5 cc. of the sample per pigeon; whereas the test made by this laboratory used one-half the dose (0.25 cc.) per pigeon. A discrepancy of results might therefore be explained on this basis.

To investigate this possibility, a series of samples was tested during 1947 for virulence in both pigeons and mice. Of 127 mice inoculated with 0.1 cc. of vaccine (this dosage is the same as that used by the U.S. BAI), 107 died with erysipelas. Of 128 pigeons receiving 0.25 cc. (the standard dosage used in our tests) of the same vaccines, only 90 died with erysipelas. Therefore, it would appear that mice are more susceptible than pigeons with the amounts used. One can only surmise what would have happened had twice the dosage (comparable to that used by the U.S. BAI) been given to pigeons. In the series of tests with mice and pigeons mentioned above, it was noted that some of those samples which failed to kill any of the pigeons would cause death of only 1 or 2 of the 4 mice in each test group. Such vaccines would have been considered nonacceptable on the basis of the mouse test alone.

The results of this study should not be interpreted as a condemnation of commercially prepared vaccines of *Ery. rhusiopathiae*, nor of the methods used to control their reliability. They should be used to indicate the need for tests on such products at the end of the expiration period, in addition to that required for release of the product. If a product will remain satisfactory for sixty days, it should not be discarded at forty days. If a vaccine

will not remain virulent for forty days, something is wrong in the manufacturing process. Some of the results suggest that container size may be one factor. Other factors have been investigated.[5] The problem of producing a consistently satisfactory vaccine that will remain virulent must be solved by further investigation and lies within the province of the regulatory agency and individual producers.

The data presented in this report do not indicate the reliability or quality of vaccine now made by the various producers. More than a year has elapsed since the last sample was tested.

SUMMARY

The testing for viability and virulence in commercially prepared *Erysipelothrix rhusiopathiae* vaccines, over a period of six years, revealed considerable variation in acceptability of this product at the expiration date. The percentage of samples found not virulent at the expiration date varied from 16 to 48 for the years 1942 to 1947 inclusive.

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Antrycide—First Immunizing Chemical

The newest "miracle" in chemotherapy is antrycide which, it is claimed, will make cattle breeding safe against tsetse fly infection in no less than 4,500,000 square miles in central Africa. It is reported to be effective against all forms of trypanomiasis in cattle, horses, camels, dogs, and other animals. The drug is also credited with preventing reinfection against *Trypanosoma congolense* for six months and for slightly shorter periods against other species of that genus.

Antrycide, first named M 7555, is a white, water-soluble, crystalline powder, administered hypodermically. Says the London Correspondent to the *Journal of the American Medical Association*, "the discovery was the result of team work by chemists, biologists, veterinarians, and pharmacists of Manchester, started in 1944." Two million doses will be sent to Kenya, Uganda, and the Sudan next year.

Cell Blockade or Interference Phenomenon

The interference phenomenon or cell block theory is being used to explain a number of cases of altered susceptibility to a pathogenic agent. The mechanism of this interference is not yet understood, although it is known that certain avirulent or nonpathogenic viruses do interfere with the multiplication of a fully virulent virus, if both are present simultaneously. This is true even when the virus strains involved are unrelated.

The example familiar to most veterinarians is the use of the distemperoid (mink) virus to block the multiplication of canine distemper virus. Other examples are: Rift valley fever virus blocks that of yellow fever; lymphocytic choriomeningitis interferes with poliomyelitis; influenza antagonizes various encephalitides; swine influenza and influenza A are both protective against 1,000 lethal doses of two strains of Eastern encephalomyelitis virus.

In the present study, it was learned that a virus of Newcastle disease, when inactivated by exposure to ultraviolet light, retained its interfering capacity although it had lost its pathogenicity. It was also learned that the protection afforded could be overcome by increasing the amount of active virus used in the challenge or infecting dose. Moderately effective protection could be overcome by ten-one hundredfold increase in the amount of active virus.

By using a virus which killed only a small percentage of the embryos in incubating chicken eggs, and a blocking virus, it was possible to titrate both viruses to determine the rate and degree of multiplication. In this way, minimal effects and the degree of resistance to the lethal agent could be measured. The author has concluded that use of inactivated and active viruses of the same species lead to an interaction similar in type to the antagonism which is the basis of antibiotic action.—*F. B. Bang. M.D., J. Exptl. Med., (Feb.* 1. 1949*)*: 141-154.

Salt for Pigs.—Salt is not harmful to pigs, provided they have ready access to clean, fresh water in unlimited amounts. Pigs seldom overeat on salt, and they rarely will drink brine; but if either happens, they vomit promptly and readily.—*C. M. Vestal, D.V.M., Iowa.*

Listeria Isolated from the Liver of a Lamb

M. L. GRAY, A.B., R. N. NELSON, M.S., Ph.D., and
FRANK THORP, JR., D.V.M., Ph.D.
East Lansing, Michigan

ALTHOUGH members of the genus Listeria usually attack the central nervous system, other manifestations have been reported. Graham *et al.*,[3] 1939, and Paterson,[4] 1940, isolated *Listeria monocytogenes* from premature bovine fetuses. De Blieck and Jensen,[5] 1943, Kerlin and Graham,[6] 1945, and Rhoades and Sutherland,[7] 1948, all reported recovery of the organism from the liver of young pigs. Burn,[1] 1935, reported its presence in the liver of human infants. This report deals with an 8-day-old lamb in which *L. monocytogenes* was isolated from the liver and heart blood.

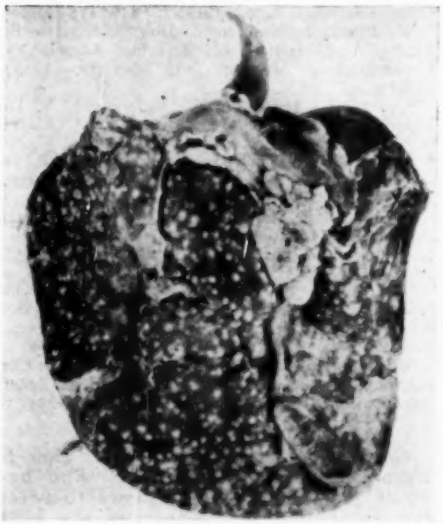

Fig. 1—Liver of lamb showing white circumscribed areas of necrosis.

The lamb, weak since birth, was presented for routine necropsy April 4, 1946. The diaphragm and omentum were firmly adhered to the liver with heavy strands of fibrin. White necrotic foci were uniformly distributed throughout the liver substance (fig. 1). The lungs were attached to the pleura. There were numerous whitish gray foci throughout the lungs. Cultures of the lung, liver, and heart blood were prepared on sheep blood agar plates. A gram-positive rod, subsequently identified as *L. monocytogenes*, was isolated from the liver and heart blood.

Tissue sections from the liver were fixed in Zenker's fluid, embedded in paraffin, and stained with hematoxylin eosin and by the Gram-Weigert method. Microscopically, the liver sections showed varying-sized areas of focal necrosis. These areas were sharply limited but were not surrounded by inflammatory cells. The nuclei of the liver cells showed pyknosis and karyorrhexis. Gram-positive rods were found distributed throughout the necrotic areas;

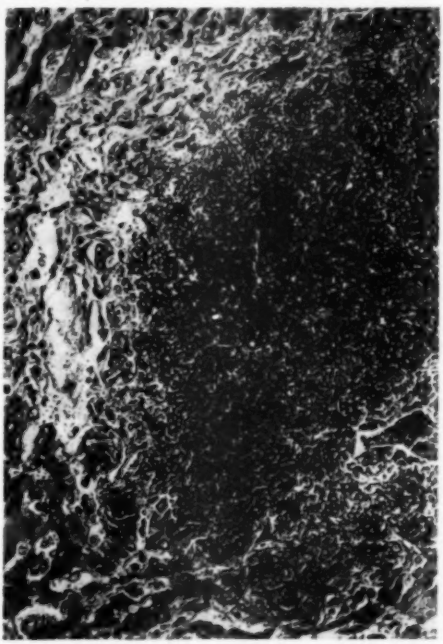

Fig. 2—Low power section of liver showing focal areas of necrosis (hemotoxylin eosin).

From the Animal Pathology Section (Gray, Thorp); and the Animal Husbandry Section (Nelson), Michigan Agricultural Experiment Station, East Lansing.

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however, they were most numerous at the periphery. Bacteria were also observed among the liver cells, just beyond the periphery of the necrotic foci (fig. 2, 3).

The ewe which bore the lamb showed no symptoms suggestive of listeriosis. However, the following year, this ewe gave birth to another weak lamb which died on the fifteenth day. A diphtheroid was isolated from the heart blood. The ewe died during a parasitism experiment in the summer of 1947.

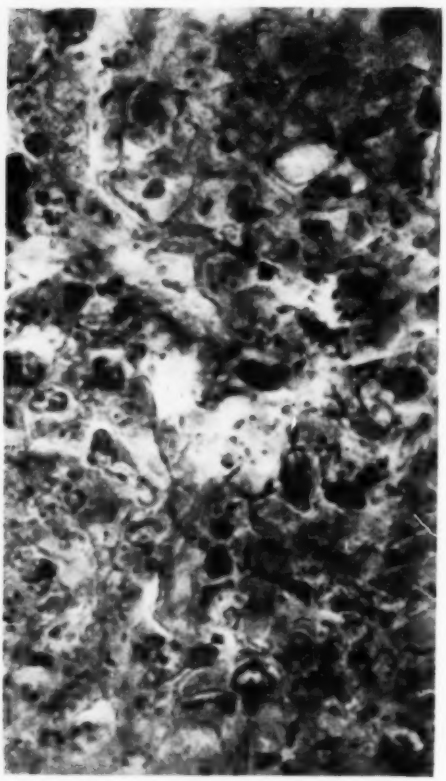

Fig. 3—High power section of a minute focal area showing bacteria as dark-stained bodies (Gram-Weigert).

DISCUSSION

A generalized infection with *Listeria monocytogenes* in a lamb has been established. A total of 4 ewes in the same flock died in the following six weeks after showing symptoms suggestive of listeriosis. This was confirmed in 2 cases by isolation of the microörganism from the medulla (Gray *et al*[4], 1947). However, these ewes had had no direct contact with the lamb nor each other, as they were housed in different areas of a large two-winged barn. None of 47 other lambs from this flock yielded *L. monocytogenes* on necropsy. The mode of transmission could not be established. There has been no further outbreak in this flock in the past two years.

SUMMARY

Isolation of *Listeria monocytogenes* from the liver and heart blood of an 8-day old lamb has been reported.

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Good Eggs.—An article titled, "How to Keep Good Eggs Good" (*U.S. Egg and Poult. Mag.*, May, 1949), shows (between the lines) that few consumers are sufficiently familiar with the taste of good eggs to banish the common sort from the market. Hen-coop-feed-nest hygiene is the starting point of a *good* egg and keeping it *good* is a matter of sanitary handling until consumed. The perfect egg, if soiled with droppings, is ruined permanently. Washing only makes matters worse. Heavy contaminations are washed through, not off of, the porous shell. The temperature to which eggs are exposed thereafter determines the extent of the bacterial growth within the contents. Only slight contamination can be disposed of by the natural germicidal action of egg white. Evaporation should be controlled to prevent enlargement of the air cell throughout the storage period. All-in-all, the production of a *good egg* is a complicated procedure from start to finish.

Mastitis Control in Delaware

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LABORATORY diagnostic service for mastitis was established in Delaware under the supervision of the writer in 1943. Dr. Vaughn C. Lancaster was appointed to conduct the service. The first annual report,[1] which covered the period from Oct. 1, 1943, to June 15, 1944, showed 159 herds under supervision. These herds comprised 1,878 cows or approximately 5 per cent of the dairy cows of the state. The number of quarters tested for this period was 7,211, of which 10 per cent showed mastitis streptococci and 12 per cent pathogenic staphylococci. After one year, Dr. Lancaster resigned because of poor health and was succeeded by Mr. E. S. Biddle.

The work of the laboratory for five years is summarized in table 1. During the past three years, the number of milk samples received by the laboratory has remained at a fairly constant level, averaging approximately 1,000 samples per month. The data are not significant as an indication of the amount of infection for the industry as a whole, since they are compiled from herds that are being retested and in which an attempt is being made, by treatment and other means, to control the infection. From this standpoint, the 3.8 per cent of *Streptococcus agalactiae* infection in 1947-1948, compared with 7 per cent in 1944-1945, is encouraging but not very significant, since the herds being tested and treated are constantly changing.

Some of the herds have benefited from the program, but in some, the results have been disappointing. In endeavoring to analyze these results, the herds may be divided into three main groups or classes from a mastitis standpoint: (1) those herds in which mastitis is caused chiefly by *Str. agalactiae* and other mastitis streptococci; (2) those herds in which mastitis is caused by some other etiologic agent; and (3) herds in which *Str. agalactiae* and other factors are responsible for the mastitis.

STREPTOCOCCIC MASTITIS

Several species of streptococci are recognized as causative agents of bovine mastitis, the most important being *Str. agalactiae*. This organism is the cause of a specific infectious disease in which the source of infection is chiefly the bovine udder. Evidence as reported by Little,[2] Plastridge,[3] Palmer,[4] and others, indicates that this form of mastitis can be successfully controlled. As in the control of all specific infectious diseases, the accurate diagnosis of all infected animals in the herd is of primary importance. Clinical diagnosis fails to detect all infected animals, and no satisfactory field or stable test has been developed. On the other hand, the laboratory testing of properly collected milk samples, in which the bacteria are identified by cultural methods, is proving satisfactory for diagnosing the infection. The following case report illustrates the results which may be obtained in herds infected with *Str. agalactiae*.

Case Report.—About two years prior to the study herein reported, the owner of a herd of approximately 50 milking, purebred, Guernsey cows requested his veterinarian to test the herd for mastitis. Milk samples were collected from individual quarters from all mature females and submitted to the State Mastitis Diagnostic Laboratory. The veterinarian reported no clinical mastitis in the herd. The laboratory bacteriologic tests revealed that all samples were negative for *Str. agalactiae*. Having a clean herd, the owner felt subsequent testing was unnecessary, and no more tests were run on the herd. About one year later, clinical mastitis appeared in the herd. The outbreak was handled by another veterinarian and milk samples were not submitted to the state laboratory for diagnosis. How the outbreak was handled from a diagnostic standpoint is not definitely known. Presumably, some type of stable test was employed. It was learned definitely that cows with clinical mastitis, and others considered to be infected, were treated with penicillin in the form of bougies inserted into the teat duct. After several months of this regime, during which new clinical cases continued to appear, and some animals receiving treatment showed no improvement, the herd was turned over to the writer for experimental study.

The clinical study of the herd revealed no acute inflammatory cases. Ten cows were found with chronic indurated quarters and with histories of giving flaky milk.

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[1]Presented before the annual meeting, Delaware Veterinary Medical Association, Newark, Del., Dec. 16, 1948.

Dr. Palmer is professor of bacteriology, Department of Biological Sciences, University of Delaware, Newark.

The laboratory bacteriologic test, which was made from milk samples collected from individual quarters, revealed 19 cows infected in 34 quarters with *Str. agalactiae*. The infected quarters were treated with sulfanilamide and penicillin-in-oil once daily for four successive days. One month later, the herd test revealed 9 cows infected in 15 quarters with *Str. agalactiae*. Of these, 3 animals were new cases and 6 were cows belonging to the group of 19 animals found infected on the first test. All infected quarters were again treated with sulfanilamide and penicillin. On the next monthly test of the herd, 4 cows infected in seven quarters were positive for *Str. agalactiae*. Three were new cases and 1 was a previously treated cow infected in one quarter. Again, all quarters showing the infection were treated. The next monthly test revealed no new cases; however, 3 of the cows previously infected were positive on this test. They were treated with a double dosage and were negative two weeks after treatment. The next monthly test of the entire herd revealed 1 new case infected in one quarter. This animal responded to treatment, and the herd has passed clean tests since that time. Of the original 19 infected cows, 13 remained in the herd after it became free of the infection. The 7 new cases which developed in the herd during the experiment responded favorably to treatment and became free of the infection. The work in this herd is summarized in table 2.

TABLE 1—Summary of Mastitis Tests, State Diagnostic Laboratory

Year	1943-1944	1944-1945	1945-1946	1946-1947	1947-1948
No. of samples	7,211	7,178	12,560	12,632	12,480
Mastitis streptococci	10%	.....	.....	.....	.....
Str. agalactiae	.....	7%	6%	3.8%	3.8%
Other mastitis streptococci	.....	2%	2%	3.7%	2.5%
Pathogenic staphylococci	12%	5.5%	4%	2.5%	8.7%
Other mastitis bacteria	.....	<1%	<1%	<1%	<1%

Streptococci other than *Str. agalactiae* (*Str. uberis*, *Str. dysgalactiae*, *Str. fecalis*, and unclassified streptococci) are responsible for sporadic cases of mastitis which are usually acute. As the source of the infection is the environment and not the bovine udder, the control and prevention of this type of mastitis is difficult. These cases, however, usually respond well to treatment.

OTHER CAUSATIVE FACTORS

Most workers regard *Str. agalactiae* as the most important cause of bovine mastitis. This is probably correct when we consider the industry as a whole, but it is not correct when we are dealing with mastitis as an individual herd problem, as the practicing veterinarian is doing, or as the control program is handled in this state. The list of bacteria associated with acute or chronic clinical mastitis is a long one and is constantly growing; no attempt will be made in this paper to review the literature dealing with this subject. Bacteria associated with acute and chronic clinical mastitis are known to exist in the environment of the cow. They are sometimes found in milk secreted by cows with apparently normal udders; and, when they are isolated from cases of clinical mastitis, it is extremely difficult to determine if they are the primary cause or are secondary to some other factor. *Staphylococcus aureus* is such an organism. In some cases of mastitis, this organism is unquestionably the primary cause, as reported by Hopkuk,[5] Minett,[6] Plastridge,[7] Palmer,[8] and others, yet it is not uncommon to find cows, with udders which are apparently sound, shedding pathogenic *Sta. aureus*. In others, it is a secondary invader.

In our early work, we reported all samples showing pathogenic staphylococci, regarding the cows with no history of mastitis as potential cases and advised treating them if positive on retest. Treating these cases, however, has proved unsatisfactory, except for the animals showing clinical mastitis. The infection in the so-called carrier cases would usually disappear following treatment but would often reappear upon later tests. As *Sta. aureus* is present in the environment of the cow, it is difficult, if not impossible, to establish herds which are free of this infection. Based upon our experience in treating this infection, we now follow the practice, at the laboratory, of reporting this infection with the notation that treatment is not indicated unless the animals show acute or chronic mastitis, high leucocyte count, abnormal milk, or high bacterial count. In Delaware, we have found quite a few herds in which mastitis is more or less a serious problem, with *Sta. aureus* appearing to be the etiologic agent. Control measures in these herds have not produced uniformly satisfactory results.

Other organisms, as *Pseudomonas aeruginosa* as reported by Swett,[9] Pasteurella

as reported by Packer and Merchant,[7] and Corynebacterium by Palmer,[4] may be the primary causes or may serve as secondary invaders.

The view is frequently expressed by workers that, in general, mastitis caused by bacteria other than *Str. agalactiae* does not appear to be contagious. It is true there are undoubtedly herds in which mastitis is caused by a combination of etiologic factors. It is not uncommon to find herds in which some of the animals are infected with *Str. agalactiae;* others with a mastitis history are free of *Str. agalactiae* but shed other bacteria of mastitis significance, and in which there is evidence of

TABLE 2—Summary of Herd Testing for Control of Streptococcus Agalactiae

Date of test	Cows tested (No.)	Infected with *Str. agalactiae* (No.)		New cases		Reinfected or not cured	
		cows	quarters	cows	quarters	cows	quarters
8/16	54	19	34	....	....	....	....
9/16	51	9	15	3	3	6	12
10/8	52	4	7	3	6	1	1
10/29	49	3	7	0	0	3	7
11/14	45	1	1	1	1	0	0
12/3	43	0	0	0	0	0	0
12/26	48	0	0	0	0	0	0
3/15	50	0	0	0	0	0	0

Of the original 19 infected cows, 13 are in the herd as of February, 1949.

that many of the cases apparently caused by the other bacteria appear sporadic, but when outbreaks occur, in which a number of cows in the herd develop mastitis, and the same organism is isolated from all, the infection assumes the practical significance of contagious disease.

It is possible, and quite probable, that in outbreaks where a few, or many, cases of mastitis develop, the primary cause is some factor in the herd management whereby udders are injured and bacteria present in the environment readily gain entrance into the udder, setting up a mild or severe mastitis. Neave, Sloan, and Mattick[3] report an outbreak of 26 cases in a herd of 50 cows that was free of *Str. agalactiae* infection. The outbreak was attributed to an increase in vacuum of the milking machine from 15 to 19.5 in. They state, "others have reported similar outbreaks where the partial vacuum of the machine used has been inadvertedly or experimentally increased." It is obvious that, in outbreaks of this kind, control measures based upon laboratory findings identifying the bacteria present are likely to be disappointing. In addition to treating the infected cows, it is highly important to diagnose the errors in management and to remove the primary cause. The correct solution for the problem will require a careful study, on the part of the attending veterinarian, of the management practices on the farm.

COMBINED FACTORS

Based upon observations made upon clinical studies and laboratory findings, poor management. Such a herd must be handled as an individual problem and the control measures based upon the etiologic agents operating in that particular herd. The laboratory can render valuable assistance, but in order to solve the mastitis problem in many herds we need, in the field, men who are well trained and experienced and who are willing to make a careful study of each herd.

The etiology of mastitis is complicated. Many different bacteria are found associated with clinical cases. It is difficult to determine if the bacteria isolated are primary or secondary invaders. Control measures are not likely to succeed unless the primary cause is removed. In herds where *Str. agalactiae* is the primary cause of the mastitis, evidence is accumulating that this infection can be controlled. Properly conducted laboratory tests are an essential aid in diagnosis and control, but, in some herds experiencing serious mastitis trouble, it will be necessary to look beyond the laboratory findings and search the environment for the primary cause.

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X Disease—Is DDT A Factor?

A rather extensive study and contact with other men in the medical field suggests that the picture concerning X disease and DDT is generally as follows.

Our first cases of this disease appeared at about the same time that DDT began to be used more or less widely in the field. The hyperkeratosis syndrome has been diagnosed in conjunction with vitamin A deficiency, but the other symptomatology, such as lacrimation, oral lesions, and the like are not seen in vitamin A deficient animals as a rule. The fact that a causitive organism has not been demonstrated has promoted speculation along lines of a poison, allergy, or deficiency. Since animal inoculation with material from a diseased animal has been completely negative, it is only natural that consideration be given to the possibility of DDT causing this relatively new condition in cattle. We know that DDT is deposited in the fatty tissue of the body, and will remain there for indefinite periods. Thus, the possibility of a chronic DDT poisoning, which could lead to an invasion by secondary organisms, is in the realm of possibility. Undoubtedly cattle throughout the entire country have had access to DDT, either through the feed or by local application. This widespread use of the drug corresponds to the rather wide distribution of the diagnosed cases of X disease.

Guernsey calf with a marked case of hyperkeratosis.

In examining carefully the histories of certain cases of X disease, it has been impossible to demonstrate DDT exposure. This factor, coupled with the fact that considerable numbers of cattle have been knowingly exposed to DDT over a period of years without manifesting the symptoms of X disease, makes one rather hesitant to say that DDT poisoning produces X disease. However, it is my opinion as a veterinarian that we must not overlook any possibility in attempting to find the cause of X disease.

Dr. Biskind's article discussing the use of DDT preparations in cattle is interesting (*see* JOURNAL, Jan., 1949: 20) from the standpoint of the physician attempting to apply human symptoms to animals, and especially so his statement that the promiscuous use of DDT has produced numerous cases of X disease culminating in severe hemorrhagic enteritis. It has been my experience in dealing with X disease that, as a rule, the enteritis syndrome is manifested in the latter stages of the disease. Veterinarians know that great quantities of DDT preparations have been used on farms and ranches, and also that the number of animals presented to us with histories and symptoms of obvious DDT poisoning have been rather remote. We are well aware of the increasing emphasis given to allergies at this time in the field of medicine, and this factor must not be overlooked in examining the over-all picture of DDT toxicity in the field of veterinary medicine.

Enclosed is a picture of a Guernsey calf with a marked case of hyperkeratosis. This calf did not manifest the other common symptoms usually seen with X disease; biopsy examination demonstrated a hyperkeratosis similar to that seen in vitamin A deficiency. Postmortem findings were completely negative. I injected 3 normal calves with blood from this suspect, and as of this date no indications of X disease has developed in any of the 3 calves.—*George Burch, D.V.M., Pitman-Moore Company Research Farm, New Augusta, Ind.*

A Comparative Study of the Fox Encephalitis Virus and the Virus of Infectious Canine Hepatitis

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RECENTLY, attention in the United States has been focused on the syndrome described by Rubarth as "hepatitis contagiosa canis," a highly fatal disease of dogs produced by a virus distinct from the virus of Carré. Reported in Sweden and in Great Britain, the incidence of this disease in dogs appears to be increasing in this country. As described by Rubarth, this disease is usually characterized by a rapid lethal course, the most common and earliest symptom being a general apathy. Vomiting and diarrhea, often hemorrhagic in character, are common, with the animal exhibiting pain. Loss of appetite and fever generally follow. The mucous membranes usually are anemic and occasionally icteric. Lacrimation may be copious. The tonsils become swollen and reddened, indicating an acute tonsillitis. Central nervous system disturbances may appear as spasms in the extremities and neck or as a posterior paresis.

On postmortem examination, a thin, clear, slightly yellow fluid may be found in the abdominal cavity. The liver is enlarged and usually lighter in color, showing a distinct lobular design. The gall bladder thickens, due to a marked subserous edema. Circulatory disturbances are common, again characterized by edema. The brain usually is edematous and anemic. Changes found in the gastrointestinal tract are not noteworthy.

Rubarth observed that the virus producing this condition in dogs was similar to the virus of fox encephalitis described by Green, *et al.*, in their work of transmitting the fox encephalitis virus to dogs. Green described the experimental infection as a fatal infection usually running a short, violent course of less than a week. The lacrimal and nasal secretions of the dog tend to become purulent. The nervous symptoms in dogs are largely concerned with a state of excitement, often describable as a running fit. The general pathology of the disease consists of a cellular infiltration in the central nervous system and focal necrosis of the liver. Specific intranuclear inclusions are found in cells of the vascular endothelium, meningeal cells, reticulo-endothelium, hepatic cells, and, occasionally, in the cortical cells of the adrenal glands.

TABLE I—Virus Titration

	Hepatitis virus		Fox encephalitis virus	
Dilutions	1st eye	2nd eye	1st eye	2nd eye
Undiluted	+	+	+	+
10^{-1}	+	+	+	+
10^{-2}	+	+	+	+
10^{-3}	+	+	+	+
10^{-4}	+	+	+	+
10^{-5}	+	+	+	+
10^{-6}	+	—	+	—
10^{-7}	+	—	—	—
10^{-8}	—	—	—	—

Because of the similarity of the two descriptions, and because, as suggested by Rubarth, the two viruses were similar, preliminary studies were carried out to determine if the viruses were the same immunologically.

The technique of Evans, Yanamura, and Green for detecting the presence of fox encephalitis virus in tissue, by injecting this material into the anterior chamber of the eye of a fox, was used in the work described here. This technique proved to be reliable and offered an ideal method not only for titrating the fox encephalitis virus, but also in neutralization tests to determine the potency of various serums.

Titration of hepatitis virus using the intraocular test for encephalitis has shown positive symptoms of encephalitis in test animals (fox) in dilutions up to 10^{-6}. Neutralization tests using hepatitis virus and antiserum produced against the fox encephalitis virus have shown neutralization of the hepatitis strain of virus in dilutions up to 1:50.

These preliminary studies suggested that a more detailed investigation be undertaken. For these studies, the hepatitis

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virus furnished us by Rubarth was used to produce antiserum. The fox encephalitis serum was produced from a virus isolated from foxes on the Fromm ranches. Cross-neutralization tests were made using the hepatitis virus with the serum made for hepatitis virus, as well as the serum for fox encephalitis virus. The reverse titrations were also carried out—that is, fox encephalitis virus neutralization tests with serum against both the hepatitis virus and the fox encephalitis virus.

TABLE 2—Titration of the Rubarth Virus with Hepatitis and Fox Encephalitis Serums

Dilution of serum	Hepatitis virus & hepatitis serum		Hepatitis virus & fox encephalitis serum	
	1st eye	2nd eye	1st eye	2nd eye
Undiluted	—	—	—	—
1:10	+	—	—	—
1:50	+	+	+	—
1:100	+	+	+	+
1:150	+	+	+	+
1:200	+	+	+	+
1:250	+	+	+	+

The titration of the viruses consisted of tenfold dilutions in saline and injections of 0.1 cc. of the various dilutions into the anterior chamber of fox eyes. For each dilution, 2 foxes were used—1 eye from each animal for each dilution. The foxes were killed on the fifth day, the eye enucleated, the cornea removed, and the endothelial lining scraped from the interior surface of the cornea. The scrapings were made with a scalpel, emulsified in a drop of Mayer's albumin fixative on a clean glass slide, and spread into a film. The slides were allowed to stand for one-half hour at room temperature and then stained with hematoxylin and eosin. Films thus prepared and stained clearly revealed the presence of the intranuclear inclusion body characteristic of the fox encephalitis virus. The presence of inclusion bodies was a criterion as to whether the virus was infectious. The inclusion bodies produced by the hepatitis virus by this technique were identical and could not be distinguished from those produced by the fox encephalitis virus. Table 1 shows the results of the virus titrations. With the exception of the one positive eye in 10^{-7} dilution of the hepatitis virus, the two viruses have the infectivity with potency of 10^{-6}.

The titrations of the two serums against the hepatitis virus and the fox encephalitis virus were made by diluting the serum to 1:250. To 5 cc. of the diluted serums was added 0.1 cc. of a 10 per cent brain tissue containing the virus. This serum-virus mixture stood for one and one-half hours at room temperature and was then injected into the anterior chamber of one eye of each of two foxes in the manner described above. Table 2 shows the result when hepatitis virus was titrated against the two serums. Table 3 shows the results when the fox encephalitis virus was titrated against the serums.

Tables 2 and 3 show that the hepatitis virus is neutralized equally by the hepatitis serum and the fox encephalitis serum. The same may be said about the fox encephalitis virus. It thus becomes apparent that the two viruses have a common antigen and can be considered identical.

TABLE 3—Titration of the Fox Encephalitis Virus with Hepatitis and Fox Encephalitis Serums

Dilution of serum	Fox encephalitis virus & hepatitis serum		Fox encephalitis virus & fox encephalitis serum	
	1st eye	2nd eye	1st eye	2nd eye
Undiluted	—	—	—	—
1:10	—	—	—	—
1:50	+	—	+	+
1:100	+	+	+	+
1:150	+	+	+	+
1:200	+	+	+	+
1:250	+	+	+	+

SUMMARY

The experiments here reported have shown that the hepatitis virus and the fox encephalitis virus possess the same infectivity with potency of 10^{-6}. The inclusion bodies formed in the endothelial cells lining the interior surface of the cornea appear identical as to morphologic and staining characteristics and cannot be differentiated microscopically. Serum produced by repeated injections of the hepatitis virus and fox encephalitis serum neutralizes equally well the hepatitis and fox encephalitis viruses. The experiments indicate that the two viruses have common antigenic properties and that they should be considered as the same virus, corroborating Rubarth's original observation.

Field tests of the encephalitis antiserum, by several veterinarians throughout the United States, have shown it to be effective in alleviating the above symptoms. Many cases having a poor or guarded prognosis recovered rapidly following the use of the

antiserum, often with a complete recession of symptoms within twenty-four hours.

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Virus Receptors of Cells

The mechanism by which viruses maintain themselves remains a subject for debate. It appears, however, that definite virus receptor substances must be present. Since viruses grow only on or in cells, the nature of the viruses must first be determined.

Early ideas were to the effect that a virus was much like a Bacterium, but infinitely smaller. Later theories were that the virus was more like an enzyme, and not a living substance. And finally, a virus was isolated as a crystalline protein. The question of whether the virus multiplies on, or penetrates into, the cell remains unanswered. However, definite virus receptor substances are involved in the process. Tests have been developed to measure the presence of virus receptors in erythrocytes, but only recently was it possible to study them after separation from the cell. In solution, the receptor is a virus hemagglutination inhibitor (VHI). It is mucoprotein in nature, and is a mixture of lipid-free *alpha* and *beta* globulins.

The virus adsorption on the red cell is due to a receptor point, which is destroyed by the virus — presumably by enzymatic action. Virus heated to 56 C. retained its capacity for combining with the receptors, and for agglutinating red cells, but lost its power of inactivating the reactor substance. However, the forces of attraction between virus and cell receptor are not completely identical with the forces which are destroyed when the virus becomes attached. In the multiplication of virus, the cell takes up so much fluid that the cell diameter may be multiplied as much as 100 times.—*J. Exptl. Med., (Feb.* 1, 1949): 223-243.

Skin Necrosis at Udder

Dairy cows with large udders often develop necrotic areas between the front quarters, or between the udder and the leg. These are characterized by a fetid odor. Dr. F. E. Brutsman, Traer, Iowa, reports excellent success (*Iowa Vet., 20* (March-Apr., 1949):10) from use of a solution of pyoktannin blue in alcohol (gall lotion), or of application of antimony chloride.

Japanese Equine Encephalomyelitis
Review of the Literature

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DUE TO the unknown host-vector relationship and the part that domestic animals play in the epizoötiology of Japanese B encephalitis, together with the difficult problem of obtaining and translating Japanese journals in which information on equine encephalomyelitis has been published, a review of the literature is presented.

LITERATURE REVIEW

The oldest record of this malady is that of cases in an area of Kyushu, one of the islands of Japan, in 1894.[1,2] Subsequently, numerous reports on cases of equine encephalomyelitis of an enzoötic or epizoötic nature are found.[1-7]

In certain prefectures, the onset of the summer season was invariably accompanied by localized outbreaks or sporadic cases of acute encephalitis. During 1898, 1900, and 1904, sufficient cases were reported to warrant an epizoötic description. It cannot be stated with certainty that all of the earlier recorded cases belong to one and the same entity. Case histories, clinical findings, and epizoötiology were all too brief.

The epizoötic of equine encephalomyelitis during the summer and early fall of 1935 was first reported on the island of Kyushu, then on northeastern Honshu, and, late in the season, in Hokkaido. The number reported was 1,180, but the actual number of equine cases was probably far greater.

Concomitantly with the equine epizoötic in Japan, a large-scale epidemic of an encephalitis type of infection occurred in human beings. These circumstances stimulated energetic investigations as to the etiology.

Climatic conditions were, and are, considered to have been related to the appearance of Japanese equine encephalomyelitis. The higher the temperature and the greater the humidity during the summer season. the more likelihood there was of an outbreak of this malady. It occurred more frequently in low lying areas, in the vicinity of rivers, lakes, swamps, marshy pools, or rice paddy fields.

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Young or immature horses were reported to have been more subject to attack than older animals. As a prototype, during the epizoötic of 1941 in Yamagata prefecture, 74 (88.1%) of 84 equine patients were 2 years old; 7 (8.3%) were 3 years of age; and the remaining 3 animals were 4, 5, and 7 years of age respectively.[18] No difference in the incidence of the disease because of sex was observed.

The incubation period in natural cases has not been determined. In animals experimentally inocculated either intranasally or intracerebrally with brain tissue from animals succumbing to an encephalitis type of infection, or mouse brain tissue infected with mouse-adapted human or equine strains (Japanese B encephalitis virus), the incubation period ranged from four to fifteen days (data compiled from the literature on 10 horses[19-24]).

SYMPTOMS

Clinical onset of this malady may occur with explosive abruptness, or it may follow premonitory symptoms of malaise, reduced appetite, etc. The temperature may rise very rapidly to 41 C. (103 F.) and is usually followed by symptoms of meningo-encephalomyelitis. Concomitantly with appearance of symptoms of the central nervous system (c.n.s.), high temperatures had a tendency to recede, even to the normal level, in a majority of cases.

Those cases with a predominant c.n.s. involvement, in the earlier stages, present a characteristic excitation which later may pass to depression and apathy, and even to pronounced spastic or flaccid paralysis. In other cases in which the spinal cord is primarily involved, flaccid paralysis or weakness may be observed without any indication of a disturbed sensorium. In the cerebral type of infection, the animal may be completely disoriented, kicking, rearing, or receiving extensive bodily injury without any indication of pain. It perspires freely and does not partake of food and water. As the disease progresses, weakness or paralysis appears more pronounced and the animal sinks quietly into depression and expires. Difficult deglutition, fibrillar spasm of the muscles of the limbs, sightlessness, and paresis of tongue and lips are common. Milder forms may be observed.

In fulminating cases of this malady,

death occurred within twenty-four to forty-eight hours. In less severe cases, the animal did not expire until five to seven days after the onset of symptoms. In mild cases, recovery was expected.

The fatality rate varied in individual epizoötics; for instance, the official record of the 1935 equine epizoötic shows a fatality of 33 per cent.[11] In Yamagata Prefecture in 1938 and 1941, there were 58 per cent and 11.9 per cent fatalities, respectively, reported.[17, 18] Consideration must be given to the mild or unreported cases which would influence the fatality rate.

Data have been reported which suggest widespread occurrence of inapparent infections among solipeds. Horses in enzoötic areas without clinical histories of an encephalitis type of infection had significant amounts of neutralizing antibodies for Japanese B virus, while those in nonenzoötic areas, for instance Hokkaido, had a very low percentage of antibodies.[28-40] Normal horses in epizoötic areas whose serums did not exhibit any neutralizing properties prior to the advent of human cases of encephalitis, developed a high percentage of antibodies following the summer incidence of Japanese B encephalitis, without any clinical evidence of equine encephalitis attacks.[27] It is claimed that the virus has been isolated repeatedly from the blood of nonencephalitic horses.[13,27,28]

PATHOLOGIC CHANGES

Pathologic changes are predominantly limited to the central nervous system.[8-16] A slight congestion of the meninges has been observed. There is evidence of hyperemia and occasional areas of hemorrhages throughout the tissues of the brain and spinal cord. Histologically, the vessels of the brain and spinal cord exhibit cuffs of mononuclear cells. At times, small foci of hemorrhages have been reported.

Emoto,[8] Emoto *et al.*,[11] and Itii and his associates[14] reported eosinophilic intranuclear inclusion bodies in the large ganglion cells of the hippocampus, which were similar to Joest and Degen's corpuscles found in the brain of horses with Borna disease. On the other hand, Itii *et al.*[25] reported cytoplasmic eosinophil inclusion bodies in large nerve cells of the hippocampus. Okubo[26] found both cytoplasmic and intranuclear inclusion bodies in cases in north China.

Emoto and his coworkers[10, 11] reported data of intracerebral inoculations into horses, rabbits, guinea pigs, and mice with tissues of the central nervous system of encephalitic horses from the various prefectures during the 1935 epizoötics. These authors failed to identify the etiologic agent, but stated, "The virulence of the contagious agent was very weak but we could not deny that we have succeeded in infecting one horse and a few rabbits with the emulsions prepared from the brains of affected horses."

EXPERIMENTAL DATA

Kii and his associates carried out extensive experimental work on the etiology of this disease following the epizoötic of 1935.[13, 18, 19, 20, 27] Prior to these studies, it was considered that this disease might be the same as, or at least similar to, Borna disease in Germany [8-12] or that it resembled equine encephalomyelitis (western type) in the United States.[10, 11] These opinions were based on epidemiologic and pathologic observations.

Kii *et al.* [13] succeeded in isolating a neurotropic virus in mice from brain tissue of 4 encephalitic horses during 1935 and 1936 in Tochigi and Saga prefectures. These four strains were found to be filterable, through a Berkefeld V filter, and to maintain their pathogenicity for mice when stored in glycerin over extended periods. Neutralization tests failed to distinguish each from the other. The virus produced an encephalomyelitis in horses, mice, and *Macaca rhesus* by intracerebral inoculation; while rabbits, guinea pigs, and white rats were refractory to the virus. The characteristics of the filterable agent were identical with those isolated from human patients of Japanese B encephalitis. All attempts to distinguish this agent from Japanese B virus by means of the neutralization reaction failed.

These findings indicated that Japanese equine encephalomyelitis and Japanese B human encephalitis were caused by the same etiologic agent. This conclusion was strengthened by additional investigation.[18, 19, 20, 27]

This type of equine encephalomyelitis has not been reported in areas outside of Japan, but it is believed that the disease may be widely distributed. Okubo[43] reported an outbreak of equine encephalomyelitis in north China, which he was unable to distinguish from Japanese equine encephalomyelitis on the basis of epidemiology and pathology. Geographic distribution of Japanese B encephalitis in human beings[44] may give some clue as to the distribution of Japanese equine encephalomyelitis. Thus, Japanese B encephalitis in man, in addition to Japan proper, has been reported in Siberia,[45] Korea,[46] Ryukyu Islands,[41,47] Formosa, China,[48] especially in the vicinity of Peking, and in the Maritime Krais.[45]

Neutralization tests gave information on the dissemination of the virus. Kii, Kitaoka, and Kuchii [39] carried out neutralization tests on horse serums collected from various places in the Far East and concluded that Japanese equine encephalomyelitis has a geographic distribution starting somewhere near the vicinity of the equator northward to the northernmost point of Honshu, the main island of Japan. This requires further confirmation, especially the data regarding such countries as Burma, the Philippine Islands, Malaya Peninsula, Sumatra, and Java.

In Japanese B encephalitis in man, the mosquito-transmission theory is gaining ground; it would be reasonable to consider this mode of infection among horses, too. There are not sufficient data to support adequately a thesis of contact infection. The natural reservoir of this virus in winter and nonepidemic periods is still unknown, and the role which horses play in this problem is still obscure.

After due consideration of various factors, Sabin, Ginder, and Matumoto[42] expressed an opinion that during nonepidemic years the virus of Japanese B encephalitis may undergo extensive dissemination among horses and goats, to a lesser extent among cows and rabbits, and probably also other domestic animals, at a time when transmission to human beings and chickens is either nonexistent or rare.

A vaccine has been developed from infected mouse brains inactivated with formaldehyde.[21,23] Such a vaccine is effective in producing neutralizing antibodies in horses and resistance to experimental infection of the virus. Prior to 1948, large scale vaccination was not practiced, but the vaccination procedure was recommended for horses in enzoötic areas, horses being transferred from nonenzoötic areas to enzoötic areas, or in the event of a generalized outbreak of of the disease.

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Diabetes Mellitus in a Dog

In the article "Diabetes Mellitus in a Dog" by S. Pollock and E. O. Bauman, published in the July, 1949, issue of the JOURNAL (p. 34), an error was made in the blood chemistry. It should have read:

Blood Chemistry.—Blood sugar, *404* mg. per 100 cc. of blood, instead of 40 mg. per 100 cc. of blood.

Anthrax is the deadliest of all plagues. Given free-range, it would remove all higher life from the face of the earth. Like the other great plagues—yellow fever, smallpox, typhus, typhoid, and malignant polyadenitis, which are held at bay by modern weapons—it is ready to strike at the world's population as hard as any of these has ever done.

EDITORIAL

Should the Extension Service Be Divorced from the Farm Bureau?

An editorial in a large middlewest newspaper commended the Iowa Farm Bureau and Director H. H. Kildee, director of the extension service in Iowa, for favoring legislation which would more completely separate the farm bureau and the extension service.

Recommendations of the Joint Committee on Extension Programs, Policies, and Goals, representing the USDA and the Association of Land Grant Colleges and Universities, no doubt prompted this action in Iowa. In this report, it was recommended that ". . .it would be in the public interest for any formal operating relationship between the extension service and any general farm organization to be discontinued at the earliest possible moment." Another statement, ". . .formal operating relationships with such organizations are considered detrimental to the public interest," does not seem to be consistent with the statement that, ". . . close coöperation with general farm organizations is highly desirable," or the further statement that "By this means, extension has been able to reach effectively many more people than otherwise would be possible. . . .This also encourages leadership, self-reliance, and initiative."

Illinois' Director Dissents

H. P. Rusk, dean and director, College of Agriculture, University of Illinois, dissented to this section of the report, pointing out, "that an active, vital county educational program which 'encourages leadership, self-reliance and initiative' should attract the forward-looking farmers of the community was to be expected, and it was inevitable that when such men were banded together, their thinking would find expression in other than purely educational projects." Dean Rusk further says: "In my own state, county, farm, and home bureaus. . . contributed a total of $582,997 toward the support of extension work last year."

Farm Organizations do Contribute Funds

"The Book of the States" (1948-49) by the Council of State Governments, Chicago, reveals that of the approximately $1.75 million expended for extension service in Illinois, one third came from farm organizations, one sixth from state, college, and county sources, and one half from the federal government. In Indiana, where the county extension service is almost completely separated from a farm organization, the state and college contributed one half, the federal government almost one half, and the farm organization less then $2,000 of the $1.50 million total. In Iowa, where separation of these two organizations is being recommended, the farm organization contributed one fourth, the college and state about one third, and the federal government the balance of the $1.80 million spent. These examples show that the contributions from the state and county funds will have to be greatly increased when and if the farm organizations withdraw their financial support.

As pointed out, in some states the extension service has been, and still is, closely allied to, and associated with, the farm bureau. There has been a trend to separate the two, and definite actions have been taken in some states to accomplish this objective. There are advantages and disadvantages to this movement, namely:

1) The separation of the extension service from active farm organizations will necessitate the development of another channel for the dissemination of educational material to the individual farmer.

2) Likewise, an agricultural educational program should be supported by the agricultural interests it serves.

3) The control of the local agricultural extension program should be under the direct control of the local farmers it serves. A new organization to implement the educational program will eventually lead to the participation of that group into matters other than education. Sooner or later, a resolution will be adopted or a commercial venture will be undertaken to supplement the educational program. Will the situation be improved by separation?

4) On the other hand, veterinarians too, are taxpayers, and they naturally have

every right to object when the activities of a farm organization are carried on from a public building or by persons who are paid from tax money. This is especially objectionable when one of the activities of the farm organization is commercial in nature. When the commercial venture is supplying dangerous animal disease products to the untrained and unqualified, the practice becomes entirely reprehensible.

VETERINARIANS AND THE EXTENSION SERVICE

Many veterinarians are, or have been, quick to condemn the extension service and the farm bureau. Often, they are considered synonymous and the activity of one is considered the activity of the other. Extension workers, county agricultural agents, and/or farm bureau personnel who have emphasized the diagnosis or treatment of animal diseases have aroused the enmity of veterinarians. These activities, listed as educational projects or demonstrations (such as vaccinating pigs), have caused veterinarians to object strenuously and, in many cases, have led the farm bureau into supplying the products needed for immunizing and treating animals.

Veterinarians are vitally interested in the welfare and prosperity of farmers. Beyond any doubt, the extension service and farm organizations have contributed immeasurably to the farmer's welfare. Veterinarians are participating more and more in extension service activities and, where properly administered, these activities make a valuable contribution directly to veterinarians and indirectly, through assistance, to farmers. The relationship between veterinarians and the extension service and farm organizations has improved markedly during recent years, mainly because veterinarians have come to appreciate the value of the extension service, and the extension service workers and farm organizations have endeavored to enlist the good will and coöperation of veterinarians.

Veterinarians and Feed Association Sponsor Nutrition Conference

Following the pattern and recommendations of the conferences sponsored by the AVMA and the American Feed Manufacturers' Association, the Illinois State Veterinary Medical Association and the Illinois Feed Association are sponsoring a nutrition conference for veterinarians on Sept. 1, 1949, in Peoria, Ill., at the Pabst Brewery Auditorium. This conference is the first to be held in Illinois and probably in any state.

The program will include outstanding speakers such as Gustav Bohstedt, University of Wisconsin; Paul Cannon, M.D., Billings Hospital, Chicago; Walter Berger, president of the AFMA; and several others eminently qualified to discuss animal nutrition and the relationship of veterinarians and representatives of the feed industry. The meeting will be open at 10:30 a.m. (CDST) and will adjourn at 5 p. m. Lunch and a barbecue supper will be served in the auditorium to all attending.

This spirit of friendliness and willingness to work together for their mutual welfare certainly justifies commendations for both the leaders of the profession and the feed industry in Illinois.

The eradication of rabies is the number 1 objective of the Veterinary Public Health Program—*James H. Steele, D.V.M., Washington, D.C.*

Livestock Editor's Comment on Practitioner-Client Relationships

Referring to an editorial in the April, 1949, JOURNAL, p. 251, the *American Cattle Producer* (May, 1949) voiced agreement with the view that a better understanding among owners about the insidiousness of infectious diseases and a realization of the pathologic changes that follow would eliminate much of the delay in calling a veterinarian and would make for better understanding between stockmen and veterinarians.

"But," the *Producer* declared, "may we go a step further and suggest that the veterinarian also tell the stockman frankly about those ailments which the stockman himself can diagnose and the remedies he can apply, and teach him to be his own doctor in such cases. Out in remote areas it is not simply a case of calling a veterinarian when something goes wrong. The stockman may have to rely on his ingenuity and do the doctoring. Sometimes it is possible to get a veterinarian. Again it may be that the cost would be too great.

"The stockman should know about the ailments that he himself can adequately diagnose and treat, and the veterinarian could be his best teacher, for he would not lose thereby. He would instead thus show the stockman just when to call on him and when not to. (Sometimes stockmen think they know the answer and go ahead and treat when expert services are available and needed. This sort of thing would be discouraged.) The relationship between client and veterinarian would be improved and confidence would be promoted."

NUTRITION

A Comparative Study of the Nutritive Value of Dry and Canned Dog Foods

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DURING World War II, restriction of tin for canning purposes prompted manufacturers of dog foods to attempt to produce suitable dry dog foods. The advantage of such foods, if they could be made nutritionally complete at least for growth and maintenance, is obvious. They can be priced on a dry basis, can be fed easily, have good keeping qualities and physical storage, and do not require refrigeration after the package is open. These are salient advantages over the canned preparations.

As early as 1942, Koehn[1] produced a successful dry dog ration. This ration was the sole food fed to 12 bitches for three and one half years and, during that time, over 500 young were produced and raised.

During recent years, canned dog foods have again appeared on the market. It seemed desirable to extend the observations made by Koehn and again compare the nutritive value for growth and maintenance of a selected dry dog food in national use with a number of leading brands of canned dog foods.

Nutrition research with laboratory animals has clearly revealed that adequate nutrition can be maintained with mixtures of dry ingredients including a considerable variety of natural and processed foods, as well as synthetic compounds. Attention must be given to such factors as palatability, digestibility, and adequate amounts of all dietary essentials. Once these have been established, the problem of supplying nutritionally complete foods or rations resolves itself into a matter of obtaining dependable sources of the individual ingredients and providing the mechanical equipment for mixing and processing. The exact form of the final product is important from a nutritional point of view, and it may in some cases have a bearing on the keeping quality of certain of the less stable components. Some of these topics have been more fully presented in a previous article.[2]

With reference to experiments with dry food mixtures, it should be noted that the ingredients used have been largely natural or processed foods. In recent experiments, carried out at the University of Wisconsin,[3] successful reproduction and raising of young have been accomplished with dogs fed a so-called "synthetic" type of ration. This was composed of purified casein, sucrose, corn oil, a mineral mixture, and all of the known fat-soluble and water-soluble vitamins, including folic acid and a vitamin B_{12} concentrate. Previously, it was necessary to use a liver preparation in order to supply the latter factor. Apparently, nutritionists have now reached the point at which practically all of the dietary essentials for dogs are known, although they have yet to evaluate the contribution of bacterial activity in the digestive tract.

TABLE I—Results of Experimental Feeding of Dry and Canned Dog Foods to Beagles

Ration	Sex	Initial wt. (lb.)	Final wt.	Gain	Final hemoglobin (Gm./100 cc.)
Canned 1	F	8.75	14.25	5.5	13.2
Canned 1	F	7.5	15.5	8.0	13.4
Canned 2	M	8.0	14.25	6.25	13.2
Canned 2	F	5.25	12.5	7.0	12.2
Canned 3	F	6.75	10.25	3.5	13.9
Canned 3	M	9.25	13.75	4.5	12.6
Canned 4	F	8.5	11.5	3.0	12.0
Canned 4	F	6.5	11.25	4.75	14.0
Canned 5	F	7.0	14.0	7.0	13.0
Canned 5	F	6.5	19.5	13.0	12.6
Dry	F	7.75	11.5	3.75	12.1
Dry	M	7.0	20.25	13.25	12.2

Professor of biochemistry, Michigan State College, East Lansing (Hoppert); and professor of biochemistry, University of Wisconsin, Madison (Hart).

Acknowledgment is made to Miss Alicia Lee for the analytical work involved in this study; to Dr. R. Schirmer of the Veterinary Clinic who supplied his professional services; and to Mr. C. Stahl who was responsible for the routine feeding and care of the dogs.

EXPERIMENTAL

Having established the fact that the nutritional requirements for all physiologic stages in the dog can be met by the use of dry ingredients, it is of interest and importance to know how commercial types of dry and canned dog foods compare nutritionally. Accordingly, five leading brands of canned dog foods and one nationally distributed dry dog food* were used in a study of comparative food value with several breeds of dogs kept under a variety of conditions.

In the first series, 12 Beagles, 10 to 15 weeks of age, were selected from three litters and assembled into groups of 2 so that the best distribution possible was obtained as to sex, weight, and litter representation. The animals were sheltered in permanent kennels, and each pair had access at all times to spacious outdoor runways. In the case of the canned dog foods, each animal received daily an amount of food, as it came from the can, calculated to be equivalent to an average of 20 Gm. of dry matter per pound of body weight. The dry food was, likewise, fed on the basis of 20 Gm. per pound of body weight daily and was slightly moistened with water before feeding. The total allowance of the canned, as well as of the dry, food was divided into three equal feedings. Fresh water was available to the dogs at all times. This experiment was started the latter part of October, 1947, and continued through April, 1948, so that the dogs were exposed to the rigors of a Michigan winter. Weighings were made weekly, and hemoglobin determinations at two-month intervals. The results with this group of dogs are summarized in table 1.

On the basis of consistent gains in weight and general thriftiness, the best nutritional results in this series were obtained with the dry dog food and with canned dog food 5. One of the animals receiving the dry dog food, although physiologically thrifty in every respect, was small-boned and never developed into a large animal. On the other hand, the dogs receiving canned dog foods 3 and 4 showed definite indications of unthriftiness at the end of the experimental period. One of the dogs on canned dog food 3, though still alive when the experiment was terminated, was in exceedingly poor condition. The dogs fed canned dog foods 1 and 2 were in better nutritional state than those fed 3 and 4, but were not equal to the dogs on canned food 5 or to those on the dry dog food. There appeared to be no correlation between the hemoglobin values and the over-all nutritive values assigned to the dog foods in this experiment.

In view of the fact that the above comparative feeding test was carried out under rigorous winter conditions and provided ample opportunities for outdoor activity for the dogs, it was decided to make a comparison of the same foods with dogs confined to small cages kept in a heated room in the kennels. For this purpose, a litter of Fox Terriers and one of English Collies were assembled into uniform groups of 2 and kept in cages provided with wire bottoms to prevent access to the feces. The pups were approximately 8 weeks old at the start of the three-month experiment. The dogs were otherwise managed in the same way as those in the previous series. Although

*Gro-Pup (ribbon form) dog food. Selected because it carried the first Seal of Approval of the AVMA and AAHA.

TABLE 2—Results of Experimental Feeding of Dry and Canned Dog Foods to English Collies and Fox Terriers

Ration	Sex	Initial weight (lb.)	Final weight	Gain	Bone ash (%)	Hemoglobin (Gm./100 cc.)	Vitamin C (mg./100 cc. of blood)	Vitamin A in liver (I.U./Gm.)
Collies								
Canned 1	M	5.0	10.5	5.5	53.1	13.7	0.36	539.0
Canned 2	F	4.5	8.5	4.0	56.2	14.1	0.34	5.8
Canned 3	M	5.0	11.5	6.5	55.5	13.7	0.35	6.5
Canned 4	M	5.75	12.0	6.25	55.3	13.9	0.45	28.3
Canned 5	M	5.75	14.0	8.25	55.3	14.6	0.32	12.5
Dry	M	6.0	15.25	9.25	56.0	13.8	0.38	17.3
Fox Terriers								
Canned 1	M	3.5	7.25	3.75	48.2	17.0	.....	341.0
Canned 2	M	3.25	8.5	5.25	47.7	14.0	.....	18.0
Canned 3	F	3.75	6.25	2.5	47.8	13.9	.....	10.5
Canned 4	F	2.75	4.5	1.75	47.7	14.0	.....	27.0
Canned 5	F	3.00	7.25	4.25	47.2	14.4	.....	17.9
Dry	M	3.25	8.0	4.75	49.0	14.1	.....	8.0

confined to cages (30 in. x 36 in.), the animals were very active and probably expended as much energy as those in the previous series.

At the conclusion of the experiment, the dogs were killed by electrocution and certain tissues removed for analysis. Ash determinations were made on the humeri after crushing the bones and defatting with alcohol and ether. Blood was collected from the jugular vein and analyzed for hemoglobin and, in the case of the Collies, also for vitamin C. For the latter determination, the dinitrophenyl-hydrazine procedure,[4] adapted to blood, was employed. Vitamin A storage in the liver was determined by macerating the entire liver in a Waring blender, saponifying a weighed sample, and using the antimony trichloride reagent[5] with the final chloroform solution containing the vitamin A. Inasmuch as fish liver oils or concentrates provided most of the vitamin A in all of the dog foods used, the livers were not analyzed for vitamin A-forming pigments. The results of this experiment are summarized in table 2.

In this series, there was less variation in the weight gains of the animals on the various rations. Nevertheless, some differences were noted but, with one exception, they followed the pattern of the first series. The exception was that both animals receiving the dry dog food made a better showing than those fed canned food 5 which, as has been noted, proved to be the best of the five canned dog foods tested in the first series.

The analysis of various tissues indicated marked uniformity throughout the groups except in the storage of Vitamin A in the livers. Bone development as reflected by the bone-ash values of the humeri was well maintained on all of the rations. Somewhat unexpected were the appreciably higher values of the English Collies. The hemoglobin and vitamin C values of the blood were all within the normal range. Although marked variations were found in the storage of vitamin A in the livers, there appeared to be no relation between such storage and the general response of the dogs. In no case was there an indication of a vitamin A deficiency, so that all of the foods apparently contained an adequate supply of this vitamin.

The differences in nutritive value of the foods used in these studies are, therefore, likely to be due to factors other than vitamin A, such as the biologic value of the proteins or the supply of the vitamins of the B complex group. In any case, evidence is presented that a properly formulated dry dog food equals, or exceeds, the best of the canned dog foods tested, in meeting the nutritional needs of dogs.

SUMMARY

1) The records presented in this paper show that the nutritional needs for growth and maintenance of dogs can be met by a properly prepared dry dog food.

2) In these experiments, the dogs consumed the dry dog food eagerly; thus indicating a high palatability of the food.

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Summary of Vitamins

The insert on the opposite page entitled "Summary of Vitamins" is presented through the courtesy of Standard Brands, Inc., and is reprinted from *Vitamin D Digest* for June, 1944. Information of this nature is often sought by members, and although it is realized that some changes and a few corrections could be made, it is believed that this review of the basic facts will serve as a foundation upon which to incorporate the newer information which is being published in all current issues of the JOURNAL.

Little Minerals.—Although the functions of iodine, iron, and copper in animal production are quite well understood, much remains unknown about the minimum requirement of cobalt, manganese, zinc, and potassium. However, as in the case of the key minerals, geography, climate, soil, distribution, and genetic selection vie with the trace minerals to alter the innermost physiologic process to an undetermined extent. Meanwhile, their empirical use within reason in feed supplements should not be disapproved. Minerally speaking, the formula of a balanced ration for livestock remains to be written.

Experimental data from several sources show no particular advantage in feeding value for barn-dried hay over field-cured hay on a per ton basis.—*K. L. Turk, Cornell Univ.*

Cattle-Feeding Trials with Derivatives of 2,4,5 Trichlorophenol

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ONE OF the goals in seed-treatment studies is the discovery of an effective fungicide that will be harmless to animals and that will cause little or no irritation to the operator of the seed-treating apparatus. The need for an effective fungicide of these characteristics is especially important for the treatment of cottonseed, since there are occasional instances of cattle poisoning as the result of feeding treated cottonseed, and also since there are frequent surpluses of unplanted, treated seed that might be used for oil extraction if a relatively nontoxic fungicide were used. Since zinc 2, 4, 5 trichlorophenate and 2, 4, 5 trichlorophenyl acetate in extensive field plantings have been shown to be effective fungicides for the treatment of cottonseed infested by the anthracnose fungus, pens of paired steers were fed these chemicals to ascertain the probability of acute or chronic poisoning if relatively large amounts were accidentally ingested.

MATERIALS AND METHODS

To determine the toxicity of 2, 4, 5, trichlorphenyl acetate and zinc 2, 4, 5, trichlorophenate, 16 steers ranging in weight from 360 to 630 lb. were separated into two groups of 8 each as indicated in tables 1 and 2. These 8 animals were further divided into paired groups and confined in individual pens, and were fed 1 per cent of their weight per day of a mixture of:

Cottonseed meal	400 lb.
Corn meal	400 lb.
Alfalfa leaf meal	200 lb.
Ground oyster shell	10 lb.
Salt	5 lb.

The animals also had free access to cottonseed hulls.

The commercial preparations of the two chemicals, Dow 9B and seedox,* were first mixed with cottonseed meal to obtain mixtures that contained 25 per cent of the active chemicals. Requisite amounts of these mixtures to obtain dosages of 0.8, 2.4, and 7.2 Gm./100 lb. of animal weight per day were thoroughly mixed with the concentrate before feeding to the several pens of animals. The lowest dosage was approximately equivalent to the amount the animals would receive if fed 1 per cent of their weight per day of whole cottonseed treated with these chemicals at a rate of 1.5 Gm. per kilogram of body weight,† the rate recommended for the treatment of cottonseed.

TABLE 1—Gains and Daily Feed Consumption of Steers Receiving Zinc 2,4,5 Trichlorophenate

Group 1 Animal (No.)	Active chemical per 100 lb. wt. Gm.	Daily gain lb.	Feed consumed per day per 100 lb. wt. concentrates lb.	roughage lb.	active chemical Gm.
		78-day test period			
1	0	1.43	1.06	2.78	—
2	0	1.79	1.04	2.14	—
3	0.8	2.38	0.93	2.12	0.74
4	0.8	1.90	1.04	2.32	0.82
5	2.4	2.38	1.05	2.70	2.11
6	2.4	1.31	1.00	1.90	2.70
7	7.2	2.14	0.93	2.10	6.71
8	7.2	0.83	0.94	1.79	6.59
		154-day test period			
2	0	1.69	0.87	2.09	—
5	2.4	1.75	1.07	3.05	2.37
6	2.4	1.38	0.99	2.23	2.35

The steers were weighed every two weeks, and the amounts of the chemicals fed were adjusted to the weight of the animals. The low, intermediate, and high

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*Dow 9B, Dow Chemical Co., and Seedox, Sindar Corp., respectively.

†One-half the recommended amount of seedox and Dow 9B, since both contained 50 per cent diluent, pyrophyllite, and talc, respectively.

Summary of Vitamins Required by

REPRINTED FROM VITAMIN

FACTOR Name; description of pure substance	UNITS AND METHODS OF MEASUREMENT	IMPORTANCE IN THE BODY	RESULTS OF DEFICIENCY	
			FOUR-FOOTED LIVESTOCK	POULTRY
VITAMIN A Pale yellow crystals at low temperatures. At room temperature a viscous oil. **CAROTENE PIGMENTS** Orange-red pigments, converted to vitamin A in the body. Vitamin A and its precursors are readily oxidized by exposure to air, but are stable to heat if protected from oxidation.	**Unit**—The potency of 0.6 microgram of beta-carotene is the unit for both vitamin A and carotene. This potency is, by definition, the United States Pharmacopeia (U.S.P.) Unit and the International Unit (I.U.). **Methods of measurement**—Rat growth; antimony trichloride colorimetric (carotene and vitamin A); direct colorimetric (carotene); spectrophotometric; fluorometric (tissues).	Promotes growth. Helps maintain normal mucous membranes, thus aiding resistance to infection. Essential to vision, especially to ability to see in dim light and to adjust vision to dim light. Essential for normal reproduction and lactation. Related to synthesis of vitamin C in the body (calves).	Night blindness (animal blunders into objects in dim light); total blindness in extreme deficiency, with eye infections; stunted growth; rough coat; susceptibility to respiratory infections; scours; interference with sexual development; diminished reproductive capacity; edema of the brisket and forelegs (beef cattle).	Stunted growth; diminished egg production; accumulation of urates in the ureters; urate nodules in the lining of the esophagus.
VITAMIN D There are several forms of vitamin D. The most common are vitamin D_2, the ergosterol form, which is in irradiated yeast, and vitamin D_3, the 7-dehydro-cholesterol form, which predominates in fish oil. In pure form the D-vitamins are white, crystalline, fat-soluble substances. They are relatively stable to heat.	**Unit**—Potency of 0.025 microgram of pure vitamin D_3 made by irradiation of ergosterol equals one U.S.P. or International Unit. These units are used for results of rat assays. Results of chick assays are expressed in A.O.A.C. Chick Units. For chicks a given number of U.S.P. Units of vitamin D_2 is less effective than an equal number of U.S.P. Units of D_3. For mammals, in general, the two types are equally effective. **Methods of measurement**—Rat rickets curative; chick bone ash; spectrophotometric (applicable so far only to relatively pure preparations).	Vitamin D helps the animal body to utilize efficiently the calcium and phosphorus of the ration. When insufficient vitamin D is present, the assimilation of calcium and phosphorus is poor; even though the quantities of these mineral elements are adequate and the ratio is optimum. When vitamin D is adequate, the effect of borderline amounts of calcium and phosphorus, or of an unfavorable ratio of these two elements, is minimized.	In young, growing animals there is partial or complete cessation of bone mineralization at the zones of growth, resulting in rickets. Gross signs are stiffness, swollen joints, and tetany. A moderate deficiency may mean retarded growth and less economical gains, even though gross deformities are not present. In older animals there is loss of mineral from the skeleton. Gross signs are stiffness, swollen joints, and interference with reproduction and lactation.	Growing chicks develop leg weakness (rickets). In the case of adult birds, egg production and hatchability are lowered.
RIBOFLAVIN A member of the vitamin B complex. An orange-yellow, crystalline substance, slightly soluble in water, alcohol and dilute alkali. Relatively stable to heat and oxidation. Destroyed by exposure to light.	**Unit**—Quantities are expressed in milligrams or micrograms. **Methods of measurement**—Microbiological, fluorometric; rat growth.	Constitutes a part of many oxidation-reduction systems of the cells. Promotes growth; prevents certain abnormalities of the nervous system, skin and certain special tissues of ectodermal origin. Probably is essential constituent of all living cells.	In pigs: slow growth, diarrhea, nerve degeneration; in dogs: nerve degeneration, fatty livers, vascularization of the cornea, dermatitis, weakness, collapse and death.	In chicks: slow growth and "curly-toe paralysis"; in young turkeys: dermatitis (but no dermatitis in chicks). Older birds: hatchability is lowered.
NIACIN (NICOTINIC ACID) **NIACINAMIDE (NICOTINIC ACID AMIDE)** A member of the vitamin B complex. White crystalline substance, soluble in water, alcohol and dilute alkali. Relatively stable to heat.	**Unit**—Quantities are expressed in milligrams or micrograms. **Methods of measurement**—Microbiological (bacterial); chemical; dog black tongue curative test.	As the amide, it is an essential constituent of a number of enzymes concerned with carbohydrate metabolism. It is essential for normal healthy intestinal mucosa.	In pigs: emaciation, diarrhea, nervous disorders; inflammation of the intestinal mucosa. In dogs: "black tongue," characterized by bright pink coloration of the gums, vomiting and failure of appetite. In calves: believed to be causative factor in scours of nutritional origin.	Inflammation of mouth cavity; retarded growth.
PANTOTHENIC ACID A member of the vitamin B complex. White solid, not readily water soluble, although its salts are more readily soluble. Unstable to alkali, acid, and prolonged heating. Stable to light and to oxidizing and reducing agents.	**Unit**—Quantities are expressed in milligrams or micrograms. **Methods of measurement**—Chick growth; microbiological (yeast or bacteria). Microbiological methods may require preliminary enzymatic treatment to liberate combined pantothenic acid.	Exact functions are not clear. There is evidence to suggest that pantothenic acid is related to carbohydrate metabolism.	In dogs: retarded growth, gastritis, enteritis, fatty livers, hemorrhagic kidney degeneration, collapse; in pigs: stilted gait, diarrhea, anemia, paralysis of hindquarters, lack of appetite. Pantothenic acid deficiency is one of several factors associated with gray hair of nutritional origin.	In chicks: dermatitis, retarded growth, spinal cord lesions. In hens: lowered hatchability.
CHOLINE **CHOLINE CHLORIDE** Considered by many to be a member of the vitamin B complex. The chloride is a colorless, crystalline substance, very soluble in water. Free choline is a colorless, viscous fluid.	**Unit**—Quantities are expressed in milligrams or as per cent of the ration. **Methods of measurement**—Chemical. There is also an assay method, based on perosis prevention in chicks, which is of limited application.	Concerned with normal fat metabolism. A source of "labile" methyl groups, which are closely related to the metabolism of sulfur-bearing amino acids.	In dogs: lack of appetite, fatty livers, retarded growth. In rats: hemorrhagic kidneys and a type of liver cirrhosis, retarded growth, lactation failure.	In chicks: perosis (slipped tendon); retarded growth. In older birds: decreased egg production; abortion of egg yolks.
OTHER VITAMINS	The following factors are not treated in detail in the table because present evidence does not seem to indicate definitely that they may be inadequate in practical rations: **Vitamin E**—Antisterility vitamin; also related to integrity of muscle or nerve function; has important antioxidative properties, which may warrant giving it more attention in the future. **Vitamin K**—Antihemorrhagic factor. **Thiamine**—Very important, but not likely to be deficient, since whole grains form such a large part of farm animal rations.			

y Four-footed Animals and Poultry

MIN D DIGEST,* JUNE 1944

CONDITIONS UNDER WHICH A DEFICIENCY IS LIKELY TO OCCUR	PROBABLE PRACTICAL REQUIREMENTS: FOUR-FOOTED LIVESTOCK	PROBABLE PRACTICAL REQUIREMENTS: POULTRY (Per Pound of Total Ration)	SOURCES: COMMON FEEDSTUFFS	SOURCES: SPECIAL CONCENTRATES
Cattle—When there is a shortage of pasture silage and good quality hay, as under drouth conditions. **Pigs**—When grains other than yellow corn are used, alfalfa meal is omitted and pasture is restricted. **Poultry**—When grains other than yellow corn are used, and when alfalfa or a special concentrate is not included in the ration.	It is difficult to summarize, since the requirement varies according to breed, season, and whether or not preformed A or carotene is the source. Moreover, there is not good agreement on optimum, as contrasted with minimum requirements. Older work gave 3000 I.U. per 100 pounds body weight daily of preformed vitamin A as optimum requirement of most four-footers, with carotene requirement about 3.5 times this. More recent work with calves shows carotene requirements ranging from 2000 to 9,500 I.U. per 100 pounds body weight.	**Chicks** (starting)—1200 I.U. **Chicks** (growing)—1800 I.U. **Laying and breeding hens**—3300 I.U. **Young turkeys**—2500 I.U. **Turkey breeders**—4000 I.U.	**Good**—Green pasture, green leafy legume hay, alfalfa meal (artificially cured better than sun-cured), silage. **Fair**—Grass hay, whole milk, yellow corn. **Poor**—Poor quality hay lacking in green color, grains and their products (except yellow corn), skim milk.	Fish oils and distillates. Carotene concentrates. Dried cereal grasses.
Confinement indoors. Insufficient solar ultraviolet. Low potency roughages. Replacement of sun-cured roughage by machine-cured hay or ensiled grasses.	The following are minimum requirements. In fortifying rations, customary safety factors should be included. **Calves**—400 to 500 U.S.P. Units per 100 pounds body weight daily. **Milking cows**—Preliminary studies indicate a requirement on the order of 500 U.S.P. Units per 100 pounds of body weight daily. **Pigs**—225-450 U.S.P. Units per 100 pounds of body weight daily. Requirements of other farm animals not definitely known. Needs of dogs vary with size and breed.	**Chicks**—180 A.O.A.C. Units. **Laying and breeding hens**—450 A.O.A.C. Units. **Young turkeys**—360 A.O.A.C. Units. **Turkeybreeders**—450 A.O.A.C. Units. **Ducklings**—At least 135 A.O.A.C. Units.	**Good**—Sun-cured legume hay; some types of fish meal. **Fair**—Corn silage, whole milk. **Poor**—"Machine-cured" hay; ensiled grasses. Little, if any in grains and their by-products.	Irradiated dry yeast (for four footed livestock). Fish oils. D-activated animal sterol.
Swine—In dry lot feeding if ration does not contain alfalfa meal or a similar source. **Poultry**—When ration does not contain milk or some other special source.	**Pigs**—Between 1 and 3 milligrams daily per 100 pounds body weight. **Dogs**—From 27 to 45 micrograms per pound of body weight daily, according to recent evidence; according to older evidence about 11 micrograms. **Ruminants**—Difficult to set requirements because of ability to synthesize riboflavin in digestive tract.	**Chicks**—1.6 milligrams. **Laying and breeding hens**—1.3 milligrams. **Young turkeys**—2.0 milligrams. **Breeding turkeys**—1.8 milligrams. **Ducklings**—1.35 milligrams.	**Good**—Milk, fluid and dry, alfalfa, alfalfa meal, pasture. **Fair**—White fish meal, animal protein sources. **Poor**—Grains.	Dried brewers' yeast. Liver meal. Concentrates made from liver, yeast, milk, and fermentation residues. Synthetic riboflavin.
Swine—Found to occur on rations consisting of corn, or oat groats, mineral mixture and buttermilk; a so on ration consisting of corn, tankage, 5 per cent alfalfa and a mineral mixture. **Calves**—Observed before rumen is developed and before solid foods are taken in appreciable amounts.	**Pigs**—5 to 14 milligrams daily per 100 pounds body weight. **Dogs**—About 100 micrograms daily per pound body weight. **Ruminants**—Difficult to set requirements because of ability to synthesize niacin in digestive tract after the rumen has developed.	**Chicks**—8 milligrams.	**Good**—Barley, corn gluten feed, peanut meal, wheat, wheat bran, tankage. **Fair**—Cottonseed, linseed and soybean meals, dried legumes and grasses. **Poor**—Oats, rye, corn, dried skim milk, dried whey.	Dried brewers' yeast. Liver meal. Rice bran and polish. Synthetic niacin.
Practical swine rations may be low in this vitamin even when they contain some alfalfa.	**Horses**—Apparently required; amounts not known. **Pigs**—8 to 12 milligrams daily per 100 pounds body weight. **Dogs**—45 micrograms of calcium pantothenate daily per pound of body weight for good growth in puppies. Less for older animals, but amount not definitely known.	**Chicks**—5.0 milligrams. **Laying and breeding hens**—7.0 milligrams.	**Good**—Cane molasses, peanut meal, dried whey, green grass. **Fair**—Alfalfa, wheat bran, rice bran, distillers' solubles. **Poor**—Barley, wheat germ, rolled oats, milo, yellow corn.	Dried brewers' yeast. Synthetic pantothenic acid.
In the case of poultry rations containing 30 per cent or more of soybean meal and 50 per cent yellow corn, retarded growth is sometimes observed, and this has been traced to a deficiency of the amino acid methionine, the amount and availability of which vary in different samples of soybean meal. By increasing the choline content of such a ration, "labile methyl" groups are provided, which, by combining with another amino acid, cystine, make additional methionine, thus relieving the deficiency.	Requirements for choline are variable, depending upon the presence and concentration of other dietary factors, such as methionine, cystine, betaine, cholesterol, thiamine and biotin. According to one determination, puppies require about 22 milligrams of choline daily per pound of body weight. For pigs, a requirement of 450 milligrams per 100 pounds daily has been reported.	**Growing chicks**—0.7 gram. **Young turkeys**—0.9 gram.	**Good**—Animal protein concentrates, fish meal, cottonseed and soybean meal, peanut meal, wheat germ meal, distillers' solubles, yeast. **Fair**—Alfalfa, dried whey, dried skim milk, wheat bran. **Poor**—Corn meal.	Liver meal. Crude lecithin. Synthetic choline.

Vitamin C—Until recently believed not important for either poultry or four-footed farm animals. Present indications are that it may have an essential role, but more evidence is needed.

There are various factors which are not likely to be low in practical rations, since they were discovered through the use of highly purified diets. Among these are: Pyridoxine (vitamin B_6); Grass juice factor; Vitamin M, which prevents scurvy-like lesions in monkeys; Factor R, associated with chick growth, perosis, egg production and hatchability; Factor S, associated with chick growth; "Folic Acid", which seems to be a complex, including B_{10} and B_{11} and possibly Factor R; Gizzard erosion factor; Biotin (Vitamin H, or anti-egg-white injury factor); Cartilage factor; Inositol; Para-aminobenzoic acid.

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dosages of the chemicals were fed for seventy-eight days. To ascertain the possibility of chronic poisoning, the animals that received the intermediate dosage (2.4 Gm.) were fed this quantity for an additional seventy-six days (tables 1 and 2).

After feeding 7.2 Gm. of zinc 2, 4, 5 trichlorophenate (Dow 9B) and 7.2 Gm. 2, 4, 5 trichlorophenyl acetate (seedox) for seventy-eight days to animals 7 and 8 (group 1) and 15 and 16 (group 2), steers 7 and 16 were slaughtered and 20-Gm. portions of the liver, kidney, and muscle were analyzed for zinc and phenol, respectively. The tissues of animal 16 were negative for phenol. The analyses for zinc in the tissues of animal 7 were: liver 170 p.p.m., kidney 40 p.p.m., and muscle 16 p.p.m. (table 3). No abnormalities were noted at slaughter.

TABLE 2—Gains and Daily Feed Consumption of Steers Receiving 2,4,5 Trichlorophenyl Acetate

Group 2 Animal (No.)	Active chemical per 100 lb. wt. Gm.	Daily gain lb.	Feed consumed per day per 100 lb. wt. concentrates lb.	roughage lb.	active chemical Gm.
		78-day test period			
9	0	3.33	1.06	2.75	.....
10	0	1.31	0.90	2.45	.....
11	0.8	1.67	1.03	2.85	0.77
12	0.8	0	1.00	2.62	0.74
13	2.4	2.86	1.09	2.50	2.48
14	2.4	0.83	1.00	2.73	2.23
15	7.2	1.07	0.79	1.83	5.18
16	7.2	1.79	1.06	2.21	7.28
		154-day test period			
2	0	1.69	0.87	2.09	.....
13	2.4	2.00	1.12	2.82	2.60
14	2.4	1.00	1.02	2.85	2.26

TABLE 3—Results of Chemical Analysis for Zinc and Phenol of Steers 7 and 16, Respectively, After Seventy-Eight Days

Anim. (No.)		Liver p.p.m.*	Kidney p.p.m.	Muscle p.p.m.	Autopsy Exam.
7	7.2 Gm. zinc trichlorophenate per lb. body wt. per day	zinc 170	zinc 40	zinc 16	Neg.
16	7.2 Gm. 2,4,5 trichlorophenyl acetate per lb. body wt. per day	phenol 0	phenol 0	phenol 0	Neg.

*Parts per million.

In an attempt to determine the possibility of chronic poisoning from the 2.4-Gm. dosage of the two compounds over a longer period of feeding, steers 5 and 6 (group 1) and 13 and 14 (group 2) were fed for an additional seventy-six days. Steer 2 (group 1) was continued as a control. At the end of this period, the chemicals were omitted from the feed and seven days later, steers 6 (group 1) and 13 (group 2) were slaughtered, and the tissues analyzed as previously described. The tissues of animal 13 were negative for phenol. The amounts of zinc in the tissues of steer 6 were: liver 80 p.p.m., kidney 40 p.p.m., and muscle 40 p.p.m. (table 4). No organic abnormalities were observed.

The hemoglobin and packed red blood cell (hematocrit) examinations that were made every fourteen days during the test, as indicated in table 5, showed no apparent detrimental effect for the two chemicals.

DISCUSSION AND CONCLUSIONS

The compounds, zinc 2, 4, 5 trichlorophenate and 2, 4, 5 trichlorophenyl acetate, appear to be relatively nontoxic to animals when administered daily for seventy-eight and one hundred fifty-four days at the rate of 1, 3, and 9 times the quantity likely to be fed with treated cottonseed.

As both compounds were derivatives of 2, 4, 5 trichlorophenol, it was thought necessary to chemically analyze the tissues for zinc only in those animals fed zinc 2, 4, 5 trichlorophenate, and for phenol only in those fed 2, 4, 5 trichlorophenyl acetate.

The liver, kidney, and muscle tissues of the steers fed 2, 4, 5 trichlorophenyl acetate for seventy-eight and one hundred fifty-four days were negative for phenol.

Zinc was recovered in the following concentrations from steer 7 on 78-day test: liver 170 p.p.m., kidney 40 p.p.m., and muscle 16 p.p.m.; and from steer 6 on 154-day test: liver 80 p.p.m., kidney 40 p.p.m., and muscle 40 p.p.m.

TABLE 4—Results of Chemical Analysis for Zinc and Phenol of Steers 6 and 13, Respectively, After 154 Days

Anim. (No.)		Liver p.p.m.	Kidney p.p.m.	Muscle p.p.m.	Autopsy Exam.
6	2.4 Gm. zinc trichlorophenate per lb. body wt. per day	zinc 80	zinc 40	zinc 40	Neg.
13	2.4 Gm. 2,4,5 trichlorophenyl acetate per lb. body wt. per day	0	0	0	Neg.

Since the zinc content of beef liver on a fresh weight basis ranged between 35 and 84 p.p.m.,[1] 170 p.p.m. of zinc recovered

from the liver of steer 7 appeared to be excessive and the Federal Security Agency, Food and Drug Administration was consulted. Their report was, "we feel that 170 parts per million of zinc in liver for human consumption is not a serious matter, and in our opinion presents no problem."[2]

The packed red blood cell volume and hemoglobin was not affected to any great extent by the compounds.

TABLE 5—The Average Hemoglobin and Packed Red Blood Cells of Control Animals and Others Receiving Zinc 2,4,5 Trichlorophenate and 2,4,5 Trichlorophenyl Acetate daily for Seventy-Eight and 154 days

	Group 1	Amt. chemical per 100 lb. wt. per day	Av. hemoglobin Gm. / 100 cc.		Av. packed r.b.c. vol.*	
			78-day test	154-day test	78-day test	154-day te t
zinc 2,4,5 trichlorophenate	1	0	9.7	.....	31.6	.....
	2	0	10.8	10.9	35.5	35.9
	3	0.8 Gm.	11.4	.....	37.6	.....
	4	0.8 Gm.	10.7	.....	35.7	.....
	5	2.4 Gm.	10.1	10.3	33.1	33.9
	6	2.4 Gm.	10.4	10.5	35.6	35.6
	7	7.2 Gm.	11.5	.....	39.7	.....
	8	7.2 Gm.	10.3	.....	35.1	.....
	Group 2					
2,4,5 trichlorophenyl acetate	9	0	9.8	.....	33.3	.....
	10	0	8.4	.....	27.9	.....
	11	0.8 Gm.	12.1	.....	40.6	.....
	12	0.8 Gm.	12.0	.....	39.0	.....
	13	2.4 Gm.	12.7	12.8	42.3	42.6
	14	2.4 Gm.	9.6	9.8	32.3	32.4
	15	7.2 Gm.	11.6	.....	37.7	.....
	16	7.2 Gm.	11.8	.....	38.8	.....

*Average packed red blood cell volume.

No abnormalities were noted in the organs or other tissues of the slaughtered animals.

The percentage gains in weight and feed consumption of the treated animals were approximately the same as those of the controls. There was, however, considerable variation in weight gains and feed consumption between the animals in the paired pens, as would normally be expected.

When muscle tissues from the slaughtered animals were frozen and prepared as food in the usual manner, during a nine-month period, no unusual flavors or odors were noted.

References

[1]Hegsted, D. M., McKibben, J. M., and Drinker, C. K.: Supp. No. 179 to the Public Health Reports, U. S. Government Printing Office, Washington, D.C., (1945):7.

[2]Lehman, A. J. (M.D.): Personal communication.

The mineral content of grains and grasses varies from year to year and from month to month. This is true even for crops grown on the same soil in sucessive years, and must be considered in making a diagnosis of disease in pigs on pasture or in feeding lot.—*H. E. Biester, D. V. M., Iowa.*

Porcine Anemia from Niacin Deficiency

A semisynthetic ration, which contained 10 per cent casein as its sole protein, was fed to 20 weanling pigs. A control group of 8 animals received niacin in addition to the basal ration. The deficient ration, so low in protein that niacin could not be produced from an excess of tryptophan, caused the pigs to develop anemia in fifty to 120 days. Feeding extra niacin prevented development of anemia, and also corrected the condition after it had appeared.—*Nutr. Rev.*, 7, (*Apr.*, 1949): 111-112.

Was It the Feed?—A booklet published by the American Feed Manufacturers Association is a warning against passing snap judgment in the case of feed blamed for diseases and deaths, and also a warning to feed dealers not to use the booklet to prove that their feeds are nutritionally perfect. "Such misuse," says the booklet, "will backfire and destroy the coöperation among the agricultural colleges, the veterinary profession, and food control officials."

Nutrition Notes*

From birth to the time rumination is well established is a critical period of a ruminant's life. Nothing less than the highest quality of proteins will provide the newborn ruminant with adequate nutrition.

Because cereals are low in certain essential amino acids, poultry and swine are poorly nourished in the absence of an adequate intake of proteins of animal origin: milk products, meat scraps, tankage.

In ruminants, attention to the quality of proteins is of special importance only if the roughage is of poor quality (straw, weathered hay) or at that part of the fattening period when concentrates comprise the major proportion of the ration. At that time, a high quality of cereal proteins is essential.

The importance of salt in the rations of swine was definitely established by controlled trials at both the Purdue and Wisconsin experiment stations. The gains of the salt-fed over the saltless hogs were as 1 : 1.5 in the Purdue experiment.

*Reflections for Feeds and Feeding. By F. B. Morrison. 21st ed.

CURRENT LITERATURE

ABSTRACTS

Foot-and-Mouth Disease Virus Cultivation

The author describes a method for producing histologically recognizable changes in explanted lingual mucosa of susceptible cattle following prolonged contact of the cells with foot-and-mouth disease virus.

It is suggested that this procedure may be used to replace the present costly and tedious method for exact typing of field strain of virus. The details of a method of doing so are discussed.—[*H. S. Frenkel: Histologic Changes in Explanted Bovine Epithelial Tongue Tissue Infected with the Virus of Foot-and-Mouth Disease. Am. J. Vet. Res.*, 10, (*April*, 1949) : 142-145.]

Studies on Johnin

Using a method which permits numerous intradermal tests to be conducted simultaneously upon a single animal, the authors were able to compare the results obtained with each of 7 lots of johnin. They learned that there was a wide range of potency, and acquired additional information regarding the antigenic relationship between members of the genus Mycobacterium. The manner of sensitizing the animals, preparing for the comparative tests, and tabulating the responses with the aid of an especially calibrated dermal thickness gauge were reported in *American Journal of Veterinary Research* (5, (April, 1944) : 179-192).—[*Howard W. Johnson, A. B. Lerson, R. R. Henley, and A. H. Groth: Studies on Johnin: VI. The Relationship of the Allergens of Mycobacterium Paratuberculosis, Mycobacterium Tuberculosis var. Avium, Bovis, and Hominis, and Mycobacterium Phlei. Am. J. Vet. Res.*, 10, (*April*, 1949) : 138-141.]

Elimination of Stimulant Drugs in Cattle

Trials were conducted to determine the advisability of a holding period following extended feeding (120 to 201 days) to cattle, of stimulant drugs such as nux vomica and Fowler's solution. The conclusion reached was that animals stimulated with nux vomica could be marketed immediately without danger; whereas, a holding period of three to four weeks should follow prolonged use of Fowler's solution.

The authors report that strychnine is very rapidly eliminated from the tissues, and that no trace of it could be found following continuous ingestion of sublethal doses of nux vomica. Even biopsy samples collected upon conclusion of drug feeding were negative.

Arsenic was less rapidly eliminated. Biopsy samples, and a few specimens collected upon slaughter immediately after long use of Fowler's solution, approached or exceeded the maximum arsenic content permitted under the Pure Food and Drug Laws.—[*W. Ham, E. A. Kline, and M. E. Ensminger. Residual Arsenic and Strychnine in the Tissues of Drug-treated Cattle: Am. J. Vet. Res.*, 10, (*April*, 1949) :150-153.]

Virulence of Salmonella Choleraesuis

Because investigators have frequently been unable to duplicate experimental results, under apparently identical conditions, when using broth cultures of *Salmonella choleraesuis*, a quantity of such material was preserved by lyophilization and stored for later use. The results of intravenous injections and oral administration of such lyophilized cultures indicate that they maintain their pathogenicity as an invariable factor for at least ten years.—[*H. W. Schoening, C. N. Dale, L. C. Mott, and R. T. Habermann: Pathogenicity of Salmonella choleraesuis: Maintaining Virulence by Lyophilization. Am. J. Vet. Res.*, 10, (*April*, 1949) : 101-110.]

Statistical Analysis of Brucellosis Studies

Using accepted statistical methods for evaluating experimental evidence, the authors conclude that "it is highly desirable for agreement to be reached among workers in experimental brucellosis as to an adequate, but not overwhelming, dose of the causative organism, the route of exposure, and the stage in gestation at which exposure is made in experiments in cattle. The results from different laboratories would then be much more comparable than they are at present."

Results of 36 trials have been tabulated and analyzed statistically. They show that when normal animals were exposed by way of the conjunctiva to 1 million or more *Brucella abortus* organisms, 303 abortions occurred among 353 animals (85.84%).

Tests of the protection following calfhood vaccination with strain 19 were variable. Most of these tests showed uniformly good protection during the first gestation, but divergent results in later challenge exposures—largely due to lack of a standard test dose. There was, however, no definite correlation between the number of organisms and the proportion of abortions.—[*D. T. Berman, M. R. Irwin, and B. A. Beach: Statis-*

tical Considerations of Controlled Experiments in Brucellosis. Am. J. Vet. Res., 10, (*April*, 1949): 130-137.]

Veterinary Medicine in the United States

Dean R. A. Kelser presents a comprehensive discussion of the growth and rise of veterinary medicine. In his book, he traces the development of our profession from the early days of small livestock numbers at widely scattered points, to the present day of concentrations of animals at many points and for highly specialized purposes.

The article tells of the training and education of veterinarians, the services rendered to the livestock industry and to the public at large, and the accomplishments of individuals and of the profession as a unit.

For anyone seeking a basic review of the veterinary medical profession, this would serve as an outline or guide to which personal experiences could be added to meet the needs of the particular group to be contacted.—[*R. A. Kelser: The Development and Importance of Veterinary Medicine in the United States. J. A. of School and College Placement*, 9, (*March*, 1949): 13-20.]

Trichinosis in Polar Bears

Trichinosis has been diagnosed in 7 of 9 Polar bears examined. It is of interest that serologic tests for trichinosis were positive on blood specimens of 15 German soldiers who had eaten Polar bear meat. The source of infection in Polar bears is not known. Examination of tissue from several species of whale for the presence of trichinae gave negative results.—[*E. Eieland: Trichinosis in Polar Bears. Norsk Vet.-tidsskr.*, 60, (1948) :414-415.]—A. G. K.

Sulfamezathine Treatment of Coccidiosis in Chickens

Sulfamezathine was found to be effective in treating coccidiosis of chicks when given in the drinking water in a concentration of 0.2 per cent. Accidentally, a concentration of 1.0 per cent was given for a period of three days without ill effects The drug was also given with the feed.—[*O. Skjerven: Sulfamezathine for the Treatment of Coccidiosis in Chickens. Norsk Vet.-tidsskr.*, 60, (1948) :412-414.]—A. G. K.

Deficiency Diseases of Cattle Treated with Cobalt in Feed

Seventy-five cases of deficiency disease in cattle were treated with cobalt during the years 1945 to 1948. In 72 cases, the treatment was considered effective. A dose of 20 mg. daily for cows, and 10 mg. daily for calves, was used for treatment. Symptoms could be prevented by the addition of 3.5 mg. of cobalt to the diet of cows and 1.5 mg. to that of calves. In two herds with deficiency diseases, an analysis of the hay showed that there was an adequate amount of phosphorus, but the copper and cobalt content was low. Treatment with cobalt resulted in prompt recovery.—[*Olsson, E.: Investigations on the Addition of Cobalt to the Feed of Cattle with Symptoms of Deficiency Diseases. Skand. Vet.-tidskr.*, 38, (1948) : 625-642.]—A. G. K.

Equine Pneumonia in Finland

Neither the sulfonamide drugs nor penicillin fulfilled expectations when they were used in the treatment of the pneumonias which occurred among the horses of Finland. On the other hand, therapy with neosalvarsan is strongly recommended because its use was followed by favorable effects under a wide range of conditions and in the treatment of almost all types of pneumonia. A study of the blood picture of the patient is recommended as a guide in making a differential diagnosis, and as a means of instituting the most effective therapy in the early stages of disease.—[*H. Westermark: Therapeutic and Clinical Aspects of the Pneumonias Occurring in Horses in Finland During the War Years*, 1941-1944. *Nord. Vet. Med.*, 1, (1949) : 31-50.]—J. Egehoj.

Luxation of the Canine Hip

Lasting retention of the head of the femur, in perfectly normal position, was achieved in at least 16 cases reported by extreme flexion of the hip. This is achieved by bandaging the metatarsus of the injured leg and attaching a leather belt to permit the foot to be pulled up next to the body without pressure injury. This method of reduction permits untilization of the medial gluteal and the semimembranosus muscles to hold the head of the femur in place. The method is effective only in extreme flexion.—[*N. Obel: A New Method for Treatment of Dislocation of the Hip in the Dog. Nord. Vet. Med.*, 1, (1949) : 62-69.]—J. Egehoj.

Enzoötic Polymyositis in Sweden

Numerous cases of myositis in horses occurred in the spring of 1946. Young horses were especially involved, although animals of all ages were affected. The symptoms depended on the groups of muscles involved. Mild cases recovered in a few weeks, but the severe cases succumbed. Postmortem examination revealed waxlike degeneration of the musculature. The disease was mainly restricted to Vastergotland in the lowlands about rivers and lakes where drainage is poor. The feed consisted of hay, low in calcium and phosphorus due to the acidity of the soil. There was an increase in the blood level of pyruvic acid and lactic acid in 2 cases studied. Although deficient diet may be a contributing cause, the precipitating factor is muscular activity.—[*Alström, I.: Enzoötic Polymyositis in Skaraborg (Sweden) During* 1946. *Skand, Vet.-tidskr.*, 38, (1948): 593-624.]—A. G. K.

BOOKS AND REPORTS

The Rh Factor

Although of no current significance in veterinary pathology, this newly found factor has surpassed in theoretic and clinical importance all former discoveries in human hematology. In our field, it may furnish clues to unknown factors in blood research and, assuredly, is not being by-passed in the academic sense. Existing as it does in 85 per cent of all white people and reflecting, as it has, its power of agglutination to the useful ends of saving newborn infants, avoiding misalliance, and even detecting criminals, the Rh factor has taken its place among the great medical discoveries of modern times, along with bacteria, viruses, vitamins.

In the absence of space for details, it must be said that the "Rh Congress" at Naples in November, 1948, in which all of the European countries participated, has documented the facts related thereto and made them available to our libraries.—[*Atti del Convegno sui problemi practici del factore Rh. Revista dell'Instituto Sieroterapico Italiano. Naples and Milan, Italy.* 1948.]

Canine Surgery

The material for this anthology on canine surgery was provided by 24 of America's specialists—11 outstanding clinicians, 4 fluent writers on clinical pathology, a dean, and 8 professors in accredited colleges of veterinary medicine.

The book is crammed with useful information, practical hints, and sound advice by surgeons whose work and sympathetic attitude toward man's best friend have greatly improved the profession's public relations. The chapter on anatomy is excellent and beautifully illustrated. The material on panhysterectomy, sterilization of matériel, general anesthesia, and fracture fixation is fine, complete, and commendable. The chapter on physiology should have been named hematology.

Allowing groups of writers to say what they please in the way they please is flouting the fact that a chain cannot hold beyond the strength of its weakest link, however. It leaves a trail of cumbersome construction, prolixity, bad English, and grammatic irregularities, because the good clinician may be a careless writer. In this book, inconsistent punctuation catches the eye throughout; and one wonders how long writers (and editors) will remain unaware that the names of breeds are proper nouns. To find boxer and Boxer, greyhound and Chow, dachshund and Dachshund, and similar examples in a piece of published literature would be quite astonishing had this reviewer not found in recent years that good English is thrown to the four winds in veterinary literature, at the expense of the profession's standing in the world of science. In this instance, it is particularly bad, since the book is almost certain to be widely used as a student text, and as a reference by physicians perfecting surgical techniques or adding to the knowledge of physiology of the body organs.

Another penalty of multiple authorship is the tendency of writers to trek into unfamiliar ground. Here we have excellent surgeons ascribing anodyne action to barbiturates, local sedative action to Epsom salts, regenerative power to muscle cells and cartilage, and a vague concept of re-innervation, to mention but a few.

As a practitioner's manual, the arrival of "Canine Surgery" is opportune, for canine medicine is expanding far afield from the large urban centers and is engaging the attention of many general practitioners. The *North American Veterinarian* plays the dual role of editor and publisher. It accomplishes the declared purpose of the undertaking, which is, "to satisfy the demand for a modern, complete book on canine surgery, to provide useful information for the student in training, to furnish data for the instructor to amplify in the classroom, and to serve the needs of the practitioner."

Careful editing, in addition, could have enhanced the standing of the canine surgeon professionally, scientifically, and culturally.—[*Canine Surgery. By 24 authors. Edited by H. Preston Hoskins and J. V. Lacroix. 565 pages. Illustrated. The North American Veterinarian, Inc., Evanston, Ill.* 1949. *Price* $12.50.]

Principles of Veterinary Science

The current edition of this textbook for students in agricultural colleges has been completely revised and modernized. Much of space devoted to discussion of horse problems in preceding editions has been given over to consideration of the problems connected with dairy cattle and other farm animals.

Part I (11 chapters, 234 pages) is devoted to the anatomy and physiology of animals. Part II (13 chapters, 279 pages) deals with the animal diseases. Of these, only three mention specific diseases, one discusses the noncommunicable diseases, another some communicable, and the third the parasitic diseases.

The text presents reliable information which livestock owners can use in preventing disease and in caring for minor injuries and ailments, but the general character can be judged from the following statement in the paragraph on Uses of Medicines (p. 301): "The competent veterinarian uses medicines the actions of which he knows, and prescribes them for the treatment of sick animals, the cause of whose distress he understands. It is, therefore, not strange that he usually secures gratifying results, while the uninformed person does not."—[*F. B. Hadley: Principles of Veterinary Science. 4th ed. Cloth. 521 pages. 99 figures. W. B. Saunders Co., Philadelphia, Pa.* 1949. *Price* $5.00.]

THE NEWS

Officers Elected at Detroit

The following officers were elected at the eighty-sixth annual meeting of the AVMA in Detroit, July 11-14, 1949:

W. M. COFFEE, La Center, Ky., *president-elect.*
W. F. IRWIN, Tulsa, Okla., *first vice-president.*
O. A. LOPEZ, Puerto Rico, *second vice-president.*
J. M. VEILLEUX, Quebec, *third vice-president.*
C. A. BRANDLY, Madison, Wis., *fourth vice-president.*
A. E. BOTT, Belleville, Ill., *fifth vice-president.*
W. A. YOUNG, Chicago, Ill., *treasurer.*

Dr. Hurt's presidential address, as well as more detailed information about the convention, will appear in the September issue.

Results of Executive Board Elections in Districts IV and X

Drs. R. L. Trader and W. A. Young, of Chicago, served as a board of tellers to count the ballots in the Executive Board elections which were completed on June 22 and certified the following results:

In District IV (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia, Cuba, Puerto Rico, and the West Indies), Dr. R. S. Sugg, of Auburn, Ala., was elected to succeed Dr. B. E. Carlisle, of Camilla, Ga.

In District X (Michigan and Ohio), Dr. B. J. Killham, East Lansing, Mich., was elected to succeed Dr. W. R. Krill of Columbus, Ohio.

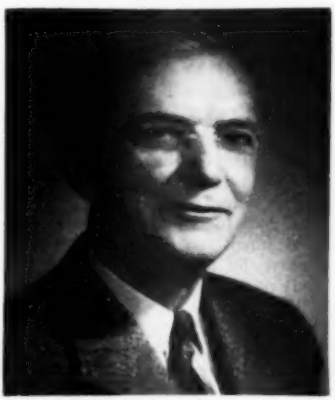
Both Dr. Carlisle and Dr. Krill served one term on the Board, having been elected in 1944; the latter had been chairman since 1947. Drs. Sugg and Killham were elected for five-year terms beginning at the conclusion of the annual meeting in Detroit last month and terminating in 1954.

Dr. Sugg was born in Old Sparta, N. Car., Oct. 19, 1893, and received his primary and secondary education in the North Carolina schools. He completed the course in animal husbandry at the Alabama Polytechnic Institute in Auburn in 1914, and received his D.V.M. degree in 1915 from that institution. After practicing in Washington, N. Car., for a year, he spent one year as instructor in bacteriology and pathology at his alma mater. Entering the U.S. Army, V.C., in 1917 as second lieutenant, he was discharged in 1919 as captain. After returning to civilian life, he became assistant professor in bacteriology and pathology and, later, extension veterinarian, Alabama Polytechnic Institute. In 1940, he was appointed dean of the school of veterinary medicine at the Institute, in which capacity he now serves. Dr. Sugg also served in World War II.

He joined the AVMA in 1915, and was elected third vice-president in 1948. He has served as president of the Alabama Veterinary Medical Association and the Southern Veterinary Medical Association. Dr. Sugg and Miss Katharine Maud Miller were married in 1918 and have one son, Redding Stancil Sugg, Jr.

Dr. R. S. Sugg

Dr. Killham was born in Chicago Nov. 18, 1883. He married Miss Ethel Frame in 1906. Receiving his D.V.M. degree from the McKillip Veterinary College in 1912, he practiced in Iowa for a year. He spent eight years with the federal Bureau of



Dr. B. J. Killham

Animal Industry in meat inspection and hog-cholera control. In 1921, Dr. Killham became state veterinarian of Michigan and, in 1930, extension veterinarian, Michigan State College, majoring at first in brucellosis control, but for the last several years he has been engaged in educational work pertaining to diseases of all farm animals.

During the last war, Dr. Killham was procurement and assignment chairman for the state of Michigan. He joined the AVMA in 1917, and has acted as resident secretary at various times through the years. In 1919, he joined the Michigan State Veterinary Medical Association, becoming its president in 1924. At present, he is the secretary-treasurer of that Association.

AVMA Research Fellows

C. J. York was born Sept. 28, 1919. He was educated at The Ohio State University (D.V.M. 1948) and immediately reported at the New York

Dr. Charles J. York

State Veterinary College at Cornell University for work under his AVMA fellowship.

PLAN OF THE PROJECT

Dr. York will study the virus infections of domestic animals. Although viruses are known to produce disease in birds, human beings, and cats, very little is known concerning the occurrence of viruses in domestic animals. These viruses can be studied intensively because their presence is characterized by the formation of elementary (inclusion) bodies in various tissues.

Since it is unusual for a family of microörganisms to affect only a limited number (rather than the majority) of animal species, the tissues of animals showing symptoms and lesions suggestive of virus infection will be subjected to culture and study. Several substances of this nature have been isolated (2 from jaundiced cats, and several from calves with hemoglobinuria) and are being studied to determine whether they are causing the symptoms or are present as synergists.

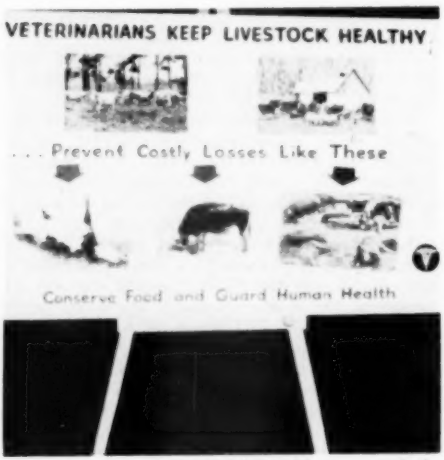
Isolations are made by guinea-pig inoculations, chicken-embryo inoculations, serial passages of suspected substances, and serologic search for complement-fixing antibodies. A convenient and accurate test for making extensive surveys is being sought, so that the natural incidence of viruses among domestic animals may be determined.

Panel Exhibit Available for Public Showing

In response to many requests from individual members and constituent associations, the AVMA has prepared a series of panels with popular appeal, depicting various phases of the work of veterinarians. This material was designed primarily for display at state and county fairs, agricultural shows, vocational guidance exhibitions, and similar events.

The series consists of four colorful and appropriately captioned panels, each measuring 44 in. wide and 28 in. long, suitable for hanging on a wall or mounting on easels. One depicts small animal practice, including surgery and rabies vaccination; another shows a contrast between healthy and diseased herds and emphasizes the veterinarian's part in conserving livestock; the third illustrates veterinary food inspection; and the fourth shows how research by veterinarians has aided brucellosis control.

Requests from individuals or local associations for the loan of this exhibit must be approved by



"Veterinarians Keep Livestock Healthy," one of the 44 in. by 28 in. panels available for showing by members or associations. The other panels will be pictured in succeeding Journals.

their respective state, provincial, or territorial associations. The shipping weight is 100 lb. The AVMA will pay shipping charges to the place of use, and the user will be asked to bear the cost for return of the material to Chicago.

STUDENT CHAPTER ACTIVITIES

Iowa Chapter Review, February to June, 1949.—Dr. Harold Gunderson, Department of Entomology, spoke to the Chapter on "Livestock Insect Control" on March 9. In the business meeting, the Chapter voted to sponsor the first annual "Iowa State Veterinary Alumni Homecoming and Reunion" on Oct. 13, 1949.

On March 25, Dr. J. H. Steele, head of the Veterinary Division of the U.S. Public Health Service, discussed "Infectious Diseases Communicable to Man." Dr. E. R. Price, also of the U.S. Public Health Service, spoke briefly on "Equine Encephalomyelitis and Its Relationship to Man."

Dr. I. H. Borts, director, state Hygienic Laboratory at Iowa City, Iowa, discussed "Human Rabies" at the March 30 meeting. He illustrated his speech with a film of a child showing typical symptoms of rabies. During the business meeting, the Chapter voted to change the name of the *Veterinary Student* to *The Iowa State College Veterinarian*.

Dr. P. V. Neuzil, a practitioner from Blairstown, Iowa, spoke, on April 20, of the "Development of a Large Poultry Practice." Donald Fuller was voted official student representative of the organization for the AVMA Convention in Detroit, July 11-14. Nominations for office for the next term were made.

The main purpose of the May 18 meeting was the election of the following officers: George Schoel, president-elect; Walter Campbell, vice-president; Marvin Clark, secretary; Melvin Miller, treasurer; Donald Perkins, critic; and Dr. Dwight Smith, faculty advisor. President R. Cowles, was succeeded by Keith Giese.

General News and Honors.—On April 2, the Women's Auxiliary to the Iowa Student Chapter of the AVMA sponsored a square dance in Great Hall Memorial Union. On May 6, the annual spring sports dance at the Ames Country Club was well attended. The annual spring picnic, on May 26, was high-lighted with a baked ham dinner served by the faculty.

John J. Edenburn was elected student body president April 13, 1949. Rollin J. Cowles, junior, was awarded second place in the National Moss Essay Contest sponsored by the American Animal Hospital Association. He attended the meeting of that group in Chicago, Ill., where he read his paper as a part of the program.

The following seniors were initiated into Gamma Sigma Delta and Phi Kappa Phi: William R. Hunter, Stanley King, Edward P. Pope, Donald O. Wiersig, and Sanford B. Wilson. Seniors from the highest sixteenth of the class are eligible for membership in Phi Kappa Phi. Seniors in the upper one-fourth of the class who have shown research ability in agriculture and related departments may be elected to Gamma Sigma Delta.

Twenty-two senior and junior students were initiated into Phi Zeta, national veterinary medicine honor society.

During the Veisha festivities, the Chapter sponsored a dog show in which forty different breeds of dogs were represented. The show proved to be the most popular display on the campus and promises to be an annual affair. The veterinary division was also represented in the parade by an appropriate float.

Float entered in Veisha parade by Iowa Student Chapter of the AVMA.

s/Otto K. Van Roekel, *Retiring Secretary.*

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Kansas Chapter.—Thirty-eight Kansas State College ROTC veterinary medical students are attending a medical field service school at Fort Sam Houston, Texas. The students will spend six weeks at the school and, among other things, will receive instruction in meat and dairy inspection service.

Kansas State College is one of six schools chosen by The Surgeon General of the Army to offer ROTC veterinary training.

s/Lowell Brandner, *Assistant Secretary.*

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Ohio Chapter.—The Delta Chapter of the Society of Phi Zeta held its annual initiation meeting on May 20, 1949, at the Ohio State University Faculty Club. Fifteen seniors, nine juniors, one graduate student, and three faculty members were elected to active membership. The new active members are, W. F. Walker, V. L. Sanger, H. V. Beavers, D. M. Chamberlin, D. Ashcraft, R. Ashcraft, R. L. Householder, E. F. Roege, J. D. Salisbury, L. L. Israel, R. W. McClung, L. M. Dennis, V. O. Thomas, B. O. Ward, L. J. Grilliot, R. G. Houser, N. Sax, H. W. Mackey, J. C. Curtis, Jr., P. C. Clinger, D. O. Early, W. K. Wearly, H. G. Headly, E. Buckley, Dr. Syed Mohiyuddeen, Dr. Richard Redding, Dr. Edward Bohl and Col. F. L. Holycross. Dr. R. L. Knudson was elected to hon-

erary membership. As its part in the Ohio State University's Diamond Jubilee, the Society sponsored a lecture by Chief B. T. Simms of the U. S. Bureau of Animal Industry. Dr. Simms presented an interesting address on the Bureau's history and achievements and its function in our Society. The lecture was attended by several hundred persons including students and faculty personnel of the various colleges of the University.

s/C. R. SMITH, *Secretary.*

WOMEN'S AUXILIARY

California Auxiliary.—The Women's Auxiliary to the California State Veterinary Medical Association met in Santa Monica at the Chase Hotel on June 20-22, 1949. In addition to the business session, the program featured a tour including broadcast, luncheon, shopping, and other entertainment.

s/MRS. E. V. EDMONDS, *Secretary.*

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Georgia Auxiliary.—At the annual meeting of the Georgia Veterinary Medical Association in Atlanta, June 12-14, 1949, 45 women met to form the Women's Auxiliary to the Georgia Association. Officers of the new organization are Mrs. Chas. C. Rife, president; Mrs. J. L. Hopping, Sr., vice-president; Mrs. Clifford Barber, secretary; and Mrs. E. E. Chambers, treasurer. After the business meeting, the women enjoyed a luncheon, shopping, and a sight-seeing tour.

s/MRS. CLIFFORD BARBER, *Secretary.*

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Idaho Auxiliary.—The Women's Auxiliary to the Idaho State Veterinary Medical Association elected the following officers at the annual summer meeting in Boise on June 20-21: Mrs. E. Don Copple, Boise president; Mrs. Leo Snyder, Boise, vice-president; and Mrs. W. E. Cameron, Nampa, secretary-treasurer.

s/MRS. W. E. CAMERON, *Secretary.*

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New York Auxiliary.—In addition to the business session, members of the Women's Auxiliary to the New York Veterinary Medical Association, on June 22-25, 1949, enjoyed a tea, harness races at Roosevelt Raceway, a DuBarry cosmetic demonstration and lecture by Ann Delafield, tour of New York Zoölogical Park, tour of the Staten Island Zoo, a visit to the Statue of Liberty, and the banquet.

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

BROWN, CHARLES W.
U.S. B.A.I., Suite 1, 1019 High St., Des Moines 9, Iowa.
D.V.M., Iowa State College, 1910.
Vouchers: H. U. Garrett and H. E. Johnston.

BRUNSCHER, LOUIS E.
1220 Vattier, Manhattan, Kan.
D.V.M., Chicago Veterinary College, 1920.
Vouchers: M. H. Cook and P. D. Cazier.

CARLOS, ENRIQUE R.
185 Marquez de Comillas, Manila, Phillippines.
D.V.M., University of the Philippines, 1946.
Vouchers: A. C. Gonzaga and J. B. Aranez.

DODDS, R. CULLEN
Lake Crystal, Minn.
D.V.M., Iowa State College, 1941.
Vouchers: W. P. Muench and O. P. Selby.

FLEMING, JOHN A.
Aberbothrie, Alyth, Perthshire, Scotland.
M.R.C.V.S., Royal Veterinary College, Edinburgh, Scotland, 1948.
Vouchers: H. C. Stephenson and E. P. Leonard.

FOGLE, ALLAN E.
2478 Neil Ave., Columbus 2, Ohio.
V.S., Ohio State University, 1910.
Vouchers: C. R. Smith and F. J. Kingma.

HURST, HAROLD L.
P.O. Box 175, Whitestown, Ind.
D.V.M., Texas A. & M. College, 1948.
Vouchers: W. G. Brock and R. V. Johnston.

LINDLEY, BENJAMIN J.
1834 Academy St., Winston-Salem, N. Car.
D.V.M., Indiana Veterinary College, 1918.
Vouchers: J. T. Dixon and J. H. Brown.

QUINN, JOHN F.
229 Linden St., East Lansing, Mich.
D.V.M., Michigan State College, 1943.
Vouchers: B. J. Killham and C. F. Clark.

Second Listing

DILLARD, WILLIAM M., 910 Jordan St., Mt. Vernon, Ill.

HICKS, CHARLES S., Carrollton, Ky.

JOHNSON, LESLIE E., Rushville, Ill.

LOMAS, JOSEPH C., 668 No. 3 Rd., Lulu Island, Vancouver, B. C.

MARKHAM, EARL S., 20 West Street, Constableville, N. Y.

RICHTER, JACOB B., 1628 Nedro Ave., Philadelphia 41, Pa.

SCOTT, ROLLAND O., 56th Medical Group, Selfridge Air Force Base, Mich.

SMITH, LAWRENCE T., Ontario Veterinary College, Guelph, Ont.

TOWNSEND, JOHN G., P. O. Box 3, Sandown, Johannesburg, Union of S. Africa.

WRIGHT, HAROLD E., 728 S. Main, Ann Arbor, Mich.

1949 Graduate Applicants
First Listing

The following are graduates who have recently received their veterinary degrees and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. Ap-

plications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Alabama Polytechnic Institute

All of the following applicants with the exception of those otherwise noted, were vouchered by W. J. Gibbons and J. F. Hokanson.

ANDERSON, WALTER C., D.V.M.
Shuqualak, Miss.
Vouchers: D. S. Folse and W. J. Gibbons.

ARLINE, ROBERT E., D.V.M.
P. O. Box 478, Greenwood, Miss.

ASHBURN, JOHN F., D.V.M.
713 W. Market St., Johnson City, Tenn.

BARTLETT, G. RAYBURN, D.V.M.
Newnan, Ga.
Vouchers: W. J. Gibbons and J. E. Greene.

BATSON, MAURICE S., D.V.M.
Rt. 2, Box 73, Eutaw, Ala.

BENSON, RICHARD E., D.V.M.
969 Springhill Ave., Mobile, Ala.

BOWERS, LAWRENCE E., D.V.M.
P. O. Box 101, Elizabethton, Tenn.

BULLINGTON, THOMAS H., D.V.M.
516 Wright Mill Rd., Auburn, Ala.

CASE, HARLAN R., D.V.M.
2277 Conifer St., P. O. Box 446, Palm City, Calif.

CATON, HORACE E., D.V.M.
216 American Building, Orlando, Fla.
Vouchers: N. D. Crandall and W. J. Gibbons.

CHAMBERS, ARTHUR R., D.V.M.
Box 405, Ocala, Fla.

GIDDENS, WILLIAM H., JR., D.V.M.
Washington, Ga.

GRAY, MYRON C., D.V.M.
3534 Post St., Jacksonville, Fla.
Vouchers: N. D. Crandall and W. J. Gibbons.

GUYTON, THOMAS L., D.V.M.
Auburn, Ala.

HARRIS, JOHN N., D.V.M.
Munford, Tenn.

HARRIS, THOMAS W., D.V.M.
Pulaski, Tenn.

HOLLAND, WILEY C., D.V.M.
P. O. Box 362, Gainesville, Fla.

HOLLOWAY, CLARKE L., D.V.M.
771 Holcombe Ave., Mobile, Ala.
Vouchers: W. J. Gibbons and J. E. Greene.

JOHNS, HOWARD L., D.V.M.
Huntingdon, Tenn.
Vouchers: J. F. Hokanson and J. G. Hardenbergh.

KENMORE, GEORGE V., D.V.M.
Box 941, Auburn, Ala.
Vouchers: N. D. Crandall and W. J. Gibbons.

KENNARD, THOMAS O., D.V.M.
29 W. 18th St., Jacksonville, Fla.

KNOX, GEORGE A., D.V.M.
Abbeville, S. Car.
Vouchers: W. J. Gibbons and B. F. Hoerlein.

MARTIN, JOHN D., D.V.M.
Mayo, Fla.

MAYFIELD, WILLIAM D., D.V.M.
c/o Mrs. W. B. Westbrook, Carnesville, Ga.
Vouchers: W. J. Gibbons and J. G. Hardenbergh.

MERRITT, BEN C., D.V.M.
Lyons, Ga.

MOSHER, WILLIAM F., D.V.M.
Box 310, Canton, Ga.
Vouchers: W. J. Gibbons and J. E. Greene.

MUCKEL, FLORENCE A., D.V.M.
c/o Dr. Fred M. Shigley, 337 U. S. Post Office and Court House, Bismarck, N. Dak.

PAYNE, SHERMAN L., JR., D.V.M.
2658 Old Shell Rd., Mobile, Ala.

POLK, HORACE H., D.V.M.
Box 145, Picayune, Miss.
Vouchers: W. J. Gibbons and D. S. Folse.

PORCH, LOUIE E., D.V.M.
809 Vaughn Ave., Opelika, Ala.

REEDY, HAROLD C., D.V.M.
P. O. Box 112, Laurel, Miss.

REYNOLDS, EUGENE M., D.V.M.
713 W. Market St., Johnson City, Tenn.

RHODES, THEODORE M., D.V.M.
Estill, S. Car.

RIEDEL, ROBERT L., D.V.M.
424 E. Drury Ave., Kissimmee, Fla.

SHEEHY, ROBERT W., D.V.M.
Box 946, Auburn, Ala.

SMALLEY, DERRELL G., D.V.M.
122 Elm St., Dublin, Ga.

SMYTHE, HOWARD V., D.V.M.
829 Common St., Lake Charles, La.

THOMPSON, RUSSELL H., D.V.M.
Corn Belt Laboratories, 215 Winstanley Ave., East St. Louis, Ill.

TIPTON, GLEN M., D.V.M.
Gurley, Ala.

VAUGHN, JOHN B., JR., D.V.M.
Calhoun City, Miss.

WIGGINS, AGEE M., D.V.M.
School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, Ala.
Vouchers: W. J. Gibbons and J. E. Greene.

WILLIAMS, WILLIAM P., D.V.M.
661 University Dr., S. W., Apt. 3, Atlanta, Ga.

YOUNG, GEORGE M., D.V.M.
McComb Animal Hospital., McComb, Miss.

Colorado A. & M. College

ALBERS, HAROLD F., D.V.M.
R. R. 1, Mitchellville, Iowa.
Vouchers: J. Farquharson and F. Cross.

BOULIER, KEITH L., D.V.M.
Cozad, Neb.
Vouchers: H. W. Johnson and J. Farquharson.

BURNSTEIN, THEODORE, D.V.M.
1366 Utica St., Denver, Colo.
Vouchers: F. Cross and H. W. Johnson.

CHEEZIG, RAY G., D.V.M.
225 Upton Ave., S., Minneapolis 5, Minn.
Vouchers: F. Cross and A. W. Deem.

CLARK, ROBERT E., D.V.M.
Watts Drive, c/o Lenore Clark, Bakersfield, Calif.
Vouchers: F. Cross and H. W. Johnson.

DAVIS, GORDON E., D.V.M.
689 S. Clarkson, Denver 9, Colo.
Vouchers: J. Farquharson and H. W. Johnson.

DICKSON, WILLIAM M., D.V.M.
Dept. of Physiology, Coll. of Vet. Med., State College of Washington, Pullman, Wash.
Vouchers: F. Cross and J. Farquharson.

EASTEP, WOODROW W., D.V.M.
818 Lancaster Way, Redwood City, Calif.
Vouchers: F. Cross and J. Farquharson.

EDWARDS, JAMES W., D.V.M.
Box 34, Sidney Neb.
Vouchers: D. D. Delahanty and L. C. Moss.

GIBSON, ELMER H., D.V.M.
Cache Veterinary Hospital, South Main St., Logan, Utah.
Vouchers: J. Farquharson and Rue Jensen

GRINER, LYNN A., D.V.M.
Rt. 4, Box 343, Fort Collins, Colo.
Vouchers: J. Farquharson and L. C. Moss.

HAAS, WALTER R., D.V.M.
Eaton, Colo.
Vouchers: J. Farquharson and F. Cross.

HAGAN, THOMAS F., D.V.M.
Rt. 6, Box 873, c/o J. W. Schroepfer, Visalia, Calif.
Vouchers: J. Farquharson and L. C. Moss.

HAMMOND, PAUL B., D.V.M.
390 Southwest 4th St., Ontario, Ore.
Vouchers: J. Farquharson and L. C. Moss.

HAWK, WALTON, D.V.M.
San Cristobal, N. Mex.
Vouchers: F. Cross and L. C. Moss.

HILL, VICTOR V., D.V.M.
608 S. College Ave., Fort Collins, Colo.
Vouchers: J. Farquharson and L. C. Moss.

HINDMAN, WILLIAM M., D.V.M.
5603 N. 4th St., Albuquerque, N. M.
Vouchers: R. W. Davis and L. C. Moss.

HUNT, FRANK W., D.V.M.
Box 357, Elk City, Okla.
Vouchers: H. W. Johnson and F. Cross.

HUTCHINSON, WENDELL F., D.V.M.
Rt. 1, Salida, Colo.
Vouchers: J. Farquharson and L. C. Moss.

KAINER, ROBERT A., D.V.M.
Dept. of Vet. Med., U. of Idaho, Moscow, Idaho.
Vouchers: L. C. Moss and J. Farquharson.

LEWIS, JOHN S., D.V.M.
572 S. Amalfi Dr., Santa Monica, Calif.
Vouchers: J. Farquharson and H. W. Johnson.

OLSEN, PETER E., D.V.M.
180 Longwood Ave., Boston, Mass.
Vouchers: L. C. Moss and F. Cross.

RIGHETTI, ALTON T., D.V.M.
124 S. Vine St., Fergus Falls, Minn.
Vouchers: J. Farquharson and H. W. Johnson.

ROSSOLL, HERMAN R., D.V.M.
Rt. 2, Box 189 C, San Diego 10, Calif.
Vouchers: J. Farquharson and H. W. Johnson.

ROTHENBERG, NORMAN A., D.V.M.
Box 208, Adelanto, Calif.
Vouchers: F. Cross and A. W. Deem.

RUBIN, ROBERT, D.V.M.
270 Eagle St., North Adams, Mass.
Vouchers: J. Farquharson and F. Cross.

SCHAFFER, ALBERT, D.V.M.
Ellenville Vet. Hosp., Laurenkill Rd., Rt. 209, Ellenville, N. Y.
Vouchers: J. Farquharson and L. C. Moss.

STODTMEISTER, EDWARD H., D.V.M.
325 Locust, Ft. Collins, Colo.
Vouchers: J. Farquharson and H. W. Johnson.

THOMAS, RALPH E., D.V.M.
3731 Walnut St., Long Beach 7, Calif.
Vouchers: F. Cross and H. W. Johnson.

WALKER, RODNEY C., D.V.M.
2910 E. Highway 24, Colorado Springs, Colo.
Vouchers: R. H. Jourdan and O. R. Adams.

WEICKUM, VICTOR, D.V.M.
935 Washington, Loveland, Colo.
Vouchers: J. Farquharson and H. W. Johnson.

WHATLEY, WILLIAM J., D.V.M.
Kimball Creek Ranch, DeBeque, Colo.
Vouchers: J. Farquharson and J. R. Naylor.

WIGGINS, GRANT E., D.V.M.
322 Grant St., Longmont, Colo.
Vouchers: D. D. Delahanty and L. C. Moss.

WILCOXON, FRANCIS D., D.V.M.
Animal Clinic, Rt. 2, Lincoln, Neb.
Vouchers: J. Farquharson and L. C. Moss.

WIXOM, DAVID H., D.V.M.
Box 126, Cambria, Calif.
Vouchers: J. Farquharson and H. W. Johnson.

Iowa State College

BENBROOK, STANLEY C., D.V.M.
2318 Baker St., Ames, Iowa.
Vouchers: E. A. Benbrook and M. W. Sloss.

COOPER, CARLOS M., D.V.M.
16 N. 4th St., Platteville, Wis.
Vouchers: G. R. Fowler and M. A. Emmerson.

KEMPEMA, JOHN A., D.V.M.
Worthington, Minn.
Vouchers: G. R. Fowler and M. A. Emmerson.

McDONALD, QUENTIN F., D.V.M.
Lorimor, Iowa.
Vouchers: I. A. Merchant and G. R. Fowler.

MORLEY, LELAND C., D.V.M.
1102 Snowden Pl., Laurel, Md.
Vouchers: I. D. Wilson and D. R. Coburn.

PEAK, FRANK A., D.V.M.
St. Charles, Iowa.
Vouchers: F. K. Ramsey and I. A. Merchant.

Preston, William R., D.V.M.
Crystal Lake, Iowa.
Vouchers: C. H. Covault and G. R. Fowler.
Ribelin, William E., D.V.M.
2823 S. Harlem Ave., Berwyn, Ill.
Vouchers: G. R. Fowler and M. A. Emmerson.
Thone, James O., D.V.M.
Blair, Neb.
Vouchers: I. A. Merchant and H. D. Bergman.
Tillie, John E., D.V.M.
208 Cedar St., Muscatine, Iowa.
Vouchers: I. A. Merchant and E. A. Hewitt.
Wiersig, Donald O., D.V.M.
Prairie du Sac, Wis.
Vouchers: M. A. Emmerson and G. R. Fowler.

Michigan State College

All of the following applicants, with the exception of those otherwise noted, were vouchered by B. J. Killham and G. W. Reed.

Alexander, Alonzo D., D.V.M.
1359 High St., Bowling Green, Ky.
Vouchers: H. H. Ruhland and B. J. Killham.
Anderson, John L., D.V.M.
257 Sixth Ave., S., South St. Paul, Minn.
Vouchers: L. B. Sholl and E. K. Sales.
Ball, William A., D.V.M.
Marne, Mich.
Bell, Iverson C., D.V.M.
6007 Hartford, Apt. 101, Detroit, Mich.
Vouchers: E. K. Sales and C. S. Bryan.
Carney, Thomas B., D.V.M.
Eyota, Minn.
Vouchers: J. N. Lietz and R. A. Runnells.
Crandell, Harry T., Jr., D.V.M.
Cass City, Mich.
Crandell, Robert A., D.V.M.
513 Woodworth Ave., Alma, Mich.
Dowdye, Edward H., D.V.M.
218 Albert Ave., East Lansing, Mich.
Dumas, Raymond L., D.V.M.
306 Knoxville Ave., Peoria, Ill.
Vouchers: C. S. Bryan and E. K. Sales.
Elsesser, Albert A., D.V.M.
146 S. Broad St., Hillsdale, Mich.
Vouchers: B. J. Killham and R. F. Langham.
Everett, Margaret A., D.V.M.
Rt. 1, Box 124, DeWitt, Mich.
Fay, Lawrence D., D.V.M.
Rogers City, Mich.
Ferstl, Henry T., D.V.M.
917 D, Walnut Lane, East Lansing, Mich.
Hagenbuch, Warren M., D.V.M.
Blissfield, Mich.
Hefler, Ann, D.V.M.
79 Smith Rd., Milton, Mass.
Hibbard, Max E., D.V.M.
172 Waterman Ave., Coldwater, Mich.
Vouchers: R. G. Schirmer and E. K. Sales.
Hulen, Ralph A., D.V.M.
Fulton, Mo.
Vouchers: F. Thorp, Jr., and B. J. Killham.
Johnston, Richard L., D.V.M.
834 E. Main St., Owosso, Mich.
Vouchers: G. W. Reed and H. D. Webster.
Johnston, Raymond F., D.V.M.
124 University Dr., East Lansing, Mich.
Jordan, John A., D.V.M.
Lexington, N. Car.
Kitzman, Louis M., D.V.M.
13347 Sherman Way, North Hollywood, Calif.
Krause, Orville C., D.V.M.
2211 S. Fulton St., Armada, Mich.
LaDu, Robert W., D.V.M.
404 Evergreen, East Lansing, Mich.
Lickfeldt, Wesley, E., D.V.M.
114 Charles St., East Lansing, Mich.
Vouchers: L. B. Sholl and B. J. Killham.
McDonald, Leslie E., Jr., D.V.M.
362 N. Main, West DePere, Wis.
Vouchers: E. K. Sales and B. J. Killham.
Mayeda, Bryan, D.V.M.
Rt. 1, Box 157, Loomis, Calif.
Migliaccio, Nicholas L., D.V.M.
955 West Ave., Ocean City, N. J.
Minton, Lloyd G., D.V.M.
714 S. Main St., Waupaca, Wis.
Padwee, S. Howard, D.V.M.
83 Farley Ave., Newark 8, N. J.
Vouchers: E. K. Sales and W. O. Brinker.
Rasmussen, Kenneth, D.V.M.
Sisseton, S. Dak.
Ruwitch, Joseph, D.V.M.
443 W. State St., Cheboygan, Mich.
Scott, Ronald M., D.V.M.
5525 Mead Ave., Dearborn, Mich.
Smith, Robert R., D.V.M.
Box 747, Portland, Mich.
Sofian, Peter, D.V.M.
14983 Collingham, Detroit, Mich.
Vouchers: L. B. Sholl and E. K. Sales.
Sterner, Glenn E., D.V.M.
Rt. 2, Ionia, Mich.
Turner, Robert K., D.V.M.
Rt. 1, Lapel, Ind.
Walters, Barbara P., D.V.M.
5432 W. Potomac, Chicago 51, Ill.
Wheeler, Richard A., D.V.M.
5515 Tujunga Ave., North Hollyood, Calif.

New York State Veterinary College*

Anderson, Howard F., D.V.M.
15 Orlando Ave., Kissimmee, Fla.
Vouchers: A. M. Mills and H. C. Stephenson.
Baker, Lyle A., D.V.M.
Knoxville, Pa.
Vouchers: E. P. Leonard and A. M. Mills.
Birchard, Ray F., D.V.M.
New York State Vet. Coll., Ithaca, N. Y.
Vouchers: H. C. Stephenson and J. N. Frost.
Blaney, Arthur J., D.V.M.
3908 Chestnut St., Philadelphia 4, Pa.
Vouchers: H. C. Stephenson and E. P. Leonard.
Buckley, Donald F., D.V.M.
22-35 Elmwood Ave., Buffalo 17, N. Y.
Vouchers: H. C. Stephenson and F. H. Fox.

CHRISTENSEN, GEORGE C., D.V.M.
232 Linden Ave., Ithaca, N. Y.
Vouchers: H. L. Gilman and H. C. Stephenson.
COHEN, BENNETT J., D.V.M.
214 Dryden Rd., Ithaca, N. Y.
Vouchers: A. M. Mills and M. E. Miller.
COSGROVE, ALBERT S., D.V.M.
90 Beekman St., Pittsburg, N. Y.
Vouchers: H. C. Stephenson and F. H. Fox.
DANIELS, WILLARD H., D.V.M.
Millbrook Rd., Middletown, Conn.
Vouchers: H. C. Stephenson and J. N. Frost.
DAVIS, F. LANGDON, JR., D.V.M.
Sunk Mine Farm, Cold Spring, N. Y.
Vouchers: W. A. Hagan and H. C. Stephenson.
DICKINSON, BRUCE R., D.V.M.
Ridge Rd., Ontario, N. Y.
Vouchers: H. C. Stephenson and J. M. Murphy.
DINGLEY, DANA C., D.V.M.
25 Maple Ave., Farmington, Maine.
Vouchers: H. C. Stephenson and E. P. Leonard.
FAGAN, MORTIMER M., D.V.M.
1931 E. 3rd St., Brooklyn 23, N. Y.
Vouchers: P. P. Levine and H. C. Stephenson.
FREDERICK, CHRISTABEL H., D.V.M.
1603 Olivewood Ave., Lakewood, Ohio.
Vouchers: H. C. Stephenson and A. M. Mills.
GLICK, STANLEY, D.V.M.
Mountaindale, N. Y.
Vouchers: H. C. Stephenson and M. E. Miller.
GOLDMAN, ROBERT A., D.V.M.
153-15 125 Ave., Jamaica 4, L. I., N. Y.
Vouchers: F. H. Fox and J. N. Frost.
GREENE, WILLIAM A., D.V.M.
Rt. 4, Ithaca, N. Y.
Vouchers: J. N. Frost and M. G. Fincher.
HINTON, JANE, D.V.M.
Dedham St., Canton, Mass.
Vouchers: J. H. Mark and R. C. Snyder.
HSIA, TING-YOU, D.V.M.
Central Bureau of Animal Industry, Nanking, China.
Vouchers: S. J. Roberts and F. H. Fox.
JENSEN, WAYNE I., D.V.M.
105 DeWitt Pl., Ithaca, N. Y.
Vouchers: P. P. Levine and P. Olafson.
KEATON, WILLIAM H., D.V.M.
809 E. State St., Ithaca, N. Y.
Vouchers: F. H. Fox and H. C. Stephenson.
LUNNA, RICHARD C., D.V.M.
Somerset Vet. Infirmary, Somerville, N. J.
Vouchers: H. C. Stephenson and M. E. Miller.
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Vouchers: E. P. Leonard and H. C. Stephenson.
MCENERNEY, PHILIP J., D.V.M.
306 University Ave., Ithaca, N. Y.
Vouchers: P. P. Levine and A. M. Mills.
MILLER, ALBERT W., D.V.M.
Butler Rd., Sauquoit, N. Y.
Vouchers: S. D. Johnson and K. McEntee.
OSGOOD, MURIEL, D.V.M.
Cumberland Center, Maine.
Vouchers: H. C. Stephenson and E. P. Leonard.
QUIMBY, HERBERT H., D.V.M.
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Vouchers: H. C. Stephenson and F. H. Fox.
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U. S. GOVERNMENT

Public Health Service Examination for Veterinarians.—The U.S. Public Health Service announces a competitive examination, for appointment of veterinarians in the Regular Corps of the U. S. Public Health Service, on Oct. 3-5, 1949. Applications must be received no later than September 5, 1949.

The Regular Corps is a commissioned officer corps composed of members of various medical and scientific professions. Appointments will be made in grades of assistant veterinarian (1st lieutenant), and senior assistant veterinarian (captain). Appointments are permanent and provide opportunities to qualified veterinarians for a lifetime career in research and public health. Successful candidates of this examination will be assigned to research, field investigation, and food sanitation.

Requirements are: citizenship; at least 21 years of age; graduation from a professional school of recognized standing; at least seven years of training and experience subsequent to high school for assistant veterinarian, and ten years for senior assistant veterinarian. Applicants who meet these requirements will receive an oral interview, physical examination, and written professional tests covering anatomy, physiology, biochemistry, bacteriology, pathology, parasitology, infectious diseases and epidemiology, medicine and surgery, therapeutics, materia medica, and public health.

Examinations will be held at a number of places in the United States.

Entrance pay for an assistant veterinarian with dependents is $3,811; for senior assistant veterinarian, $4,489. Promotions are at regular intervals and retirement pay begans after thirty years of service, or at the age of 64. Additional benefits include thirty days annual leave, sick leave, full medical care, and many of the usual privileges extended to members of the military forces.

For application forms and additional information write The Surgeon General, United States Public Health Service, Washington 25, D. C., Attention: Division of Commissioned Officers.

s/J. HOWARD BEARD, *Senior Surgeon Chief, Recruitment and Commissions Branch.*

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Civil Service Openings for Veterinarians.—The United States Civil Service Commission calls attention to positions in Grade P-2 at entrance salary of $3,727 a year, as described in Announcement No. 143 issued Dec. 15, 1948, and applications for which will be accepted until further notice. Most of the vacancies are in the Bureau of Animal Industry, USDA, and are located in Washington, D.C., and throughout the United States, principally in the Midwest. Duties include meat inspection, milk sanitation surveys for state and local health departments, disease control work and related activities. Periodic pay increases of $125.40 per year up to $4,479.65 are provided by law on completion of each 12 months of service for employees with satisfactory records.

Application forms may be obtained from any regional headquarters of the U.S. Civil Service, from the U.S. Civil Service Commission, Washington 25, D.C., or from any first- or second-class post office.

COMMENCEMENT

Iowa State College.—The following candidates were presented for the D.V.M. degree at the annual commencement exercises of the Iowa State College Division of Veterinary Medicine on June 10, 1949.

Allen, Philip R.
Archer, Jean N.
Armstrong, Francis M.
Benbrook, Stanley C.
Betsworth, George R.
Biller, Raymond Roy
Bredahl, F. W.
Bromwell, David R.
Buzzetti, Romaine J.
Calhoun, Edward, Jr.
Coffland, Robert T.
Cooper, Carlos M.
Cutler, James H.
Dougan, Paul K.
Ellis, Stewart C.
Emerson, Wayne L.
Erickson, Joseph W.
Flater, Guy, Jr.
Flickinger, Robert G.
Garvin, Robert E.
Hunter, Hollis B.
Hunter, William R.
Ives, Lee Herbert
Jacobs, Duane P.
Kempema, John A.
Kilpatrick, Warren J.
King, Stanley
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Lemonds, Leo
Lichter, A. W. R.
Lloyd, William E.
Lustig, Peter
McDonald, Quentin F.
Maxwell, Earl E.
Morrison, Robert E.
Neely, John L.
Nelson, LeRoy E.
Nelson, Myron A.
Neumann, Arlo J.
Patek, Theodore B.
Paulson, Quentin S.
Peak, Frank
Pinkert, Paul A.
Pope, Edward P.
Preston, William R.
Ribelin, William E.
Riordan, Robert E.
Scamman, Jack R.
Schroeder, William F.
Scobell, Elgin S.
Siemens, John W.
Skewes, Arthur R.

Graduating Class, Iowa State College, Division of Veterinary Medicine

Top row (left to right)—P. R. Allen, J. N. Archer, Dr. M. A. Emmerson, Dr. H. L. Foust, Dr. C. H. Covault, Dr. H. D. Bergman, dean, Dr. I. A. Merchant, Dr. G. R. Fowler, Dr. E. A. Benbrook, F. M. Armstrong, S. C. Benbrook.
Second row—G. R. Betsworth, R. R. Biller, F. R. Bredahl, D. R. Bromwell.
Third row—R. J. Buzzetti, E. Calhoun, R. T. Coffland, C. M. Cooper, J. H. Cutler, P. K. Dougan, S. C. Ellis, W. L. Emerson.
Fourth row—J. W. Erickson, G. Flater, R. G. Flickinger, R. E. Garvin, H. B. Hunter, W. R. Hunter, L. H. Ives, D. P. Jacobs, J. A. Kempema, W. J. Kilpatrick, S. King, T. J. Lafeber, L. Lemonds.
Fifth row—A. W. R. Lichter, W. E. Lloyd, P. Lustig, Q. F. McDonald, E. E. Maxwell, R. E. Morrison, J. L. Neely, L. E. Nelson, M. A. Nelson, A. J. Neumann, T. B. Patek, Q. S. Paulson, F. Peak.
Sixth row—P. A. Pinkert, E. P. Pope, W. R. Preston, W. E. Ribelin, R. E. Riordan, J. R. Scamman, W. F. Schroeder, E. S. Scobell, J. W. Siemens, A. R. Skewes, J. A. Sloan, R. A. Snyder, D. F. Stoppel.
Seventh row—K. M. Tabberson, P. L. Thompson, J. O. Thone, J. E. Tillie, W. B. Waters, O. W. Whitcomb, D. O. Wiersig, R. C. Williams, S. B. Wilson, L. E. Witt.

Sloan, James A.
Snyder, Robert A.
Stoppel, Donald F.
Tabberson, Kenneth M.
Thompson, Paul L.
Thone, James O.
Tillie, John E.
Waters, William B.
Whitcomb, Oliver W.
Wiersig, Donald O.
Williams, Richard C.
Wilson, Sanford B.
Witt, LaVerne E.

The honor student in veterinary medicine was Sanford B. Wilson. Dr. Wilson, thereby, became the winner of the George Judisch Award.

The winners of the G. G. Graham awards, based on the records of the student's work in clinical practice, were: first prize, Dr. Hollis B. Hunter; second prize, Dr. William R. Hunter.

Dr. Homer E. Dale, (D. V. M. from Iowa State College, 1944) was granted an advanced degree, M.S. with a major in veterinary physiology.

AMONG THE STATES AND PROVINCES

Alabama

Southern Research Workers.—The third annual meeting of the Animal Disease Research Workers in the Southern States was held in Auburn on April 7-8, 1949. There were 65 registrants representing 12 states of the southern region and the U.S. Department of Agriculture. Special guests were Dr. G. W. Stableforth, senior veterinary research officer of the Ministry of Agriculture and Fisheries, Weybridge, England, and Dr. Hasib Kurtpinor, Angora, Turkey.

President A. H. Groth was in charge of the program which dealt with subjects of special interest to the south.

The following officers were elected for the ensuing year: Dr. Herbert Schmitt (M.D.), Malakoff, Texas, president; Dr. E. C. Howell (M.D.), Oklahoma, vice-president; Mr. J. C. Grimes, Auburn, Ala., secretary-treasurer; and Drs. E. P. Johnson, Blacksburg, Va., and R. S. Sugg, Auburn, Ala., directors.

s/J. C. GRIMES, *Secretary.*

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Bans Dogs in Hotels.—The city of Montgomery (*Dog World*, March, 1949) has passed an ordinance that prohibits hotel guests from keeping dogs in their rooms. The passage of the ordinance was urged by the hotels no doubt, in part, to save arguments, but when *Dog World* roared that dogs were better than drunks, spoiled brats, and loose women, it only hurt the cause. The object of providing special quarters for dogs is more to prevent hotels from taking on the atmosphere of a kennel than to refuse an occasional guest the privilege of taking a small, well-behaved dog to his room.

California

State Association.—The annual convention of the California State Veterinary Medical Association was held at the Chase Hotel, Santa Monica, on June 20-22, 1949, with a total registration of 280. The scientific program follows.

Dr. Leo F. Conti, San Diego: "A Roving Veterinarian in Mexico."

Dr. Lauri Luoto, senior assistant veterinarian, National Institutes of Health, Bethesda, Md.: "Q Fever Studies in Dairy Cattle."

Dr. E. Jones (M.D.) showed the motion picture, "Coarctation of the Aorta."

Dr. Linett M. Walsh (Phm.g.), secretary, California State Board of Pharmacy, San Francisco: "State Pharmacy Laws and the Veterinarian."

Dr. Charles M. Carpenter, Department of Communicable Diseases, U.C.L.A., Los Angeles: "New Developments in the Field of Viral and Rickettsial Diseases."

Dr. William P. Long (M.D.), professor of surgery, U.C.L.A., Los Angeles: "Intrahepatic Cholangia Jejunostomy for External Bilary Obstruction" (with illustrations).

Dr. Logan Julian, Department of Veterinary Science, University of California, Davis: "Pathologic Basis for Hormone Therapy of Abnormalities of the Canine Prostate Gland."

Dr. Gerry B. Schnelle, assistant chief of staff, the Angell Memorial Animal Hospital, Boston: "Diagonsis as Aided by Radiography" and "Geriatrics in Small Animal Practice."

Dr. Louis J. Regan (M.D.), medical-legal advisor, Los Angeles County Medical Association: "Medical Legal Problems."

Dr. S. R. Roberts, Richmond: "Diseases and Anomalies of the Eye of the Dog and Cat."

Dr. B. F. Murray, Oakland, was moderator of a symposium on "Small Animal Practice." Other members were Drs. Preston Leroy Gsell, Los Angeles, "Medullary Repair of Bone Fractures"; Glen Kenaston, San Bernardino "Report on a Compulsory Rabies Program in San Bernardino City and County"; Maurice L. Boevers, Lafayette, "Fundamentals of Hospital Construction"; and J. K. Perry, Palo Alto, "Parasitic Skin Diseases."

Dr. Stewart Madin, Department of Veterinary Science, University of California, Berkeley: "Personal Observations on Foot-and-Mouth Disease Research in Europe."

Dr. W. W. Worcester, poultry pathologist, North Hollywood: "Results of Field Trials with Live Viris Pneumoencephalitis Vaccine."

Dr. W. G. Brock, Dallas, Texas: "Diagnosis of Lameness in Thoroughbred and Quarter Horses, Firing, Castration, and Proper Method of Passing a Stomach Tube" and "A Practitioner's Experience in Breeding and Raising Thoroughbred Horses and Purebred Cattle."

Dr. James R. Douglas (Ph.D.), assistant professor of parasitology, Davis: "Insecticides and the Practitioner."

Drs. O. W. Schalm and R. W. Ormsbee, Department of Veterinary Science, University of California, Berkeley: "Combined Effects of a Program of Management and Penicillin Treatment on the

Occurrence of Staphylococcic Mammary Infections."

Drs. W. E. Maderious and J. Traum, Department of Veterinary Science, University of California, Berkeley: "Present Status of Immunization and Diagnosis in Bovine Brucellosis."

Dr. Fred B. Pulling, Jr., Atascadero, was moderator of a panel discussion on "Equine Sterility." Other members of the panel were Drs. Jack Baker, Perris; William Dakin, North Hollywood; Stephen Lange and L. E. McGee, Arcadia.

Dr. Arthur C. Hollister, Jr. (M.D.), chief, Acute Communicable Disease Service: "Epidemiology of Human Rabies."

Dr. Ben H. Dean, public health veterinarian, Acute Communicable Disease Service: "Epidemiology of Animal Rabies."

Dr. Howard L. Bodily (Ph.D.), assistant chief, Division of Laboratories, State Department of Public Health: "Laboratory Diagnosis of Rabies."

Newly elected officers are Drs. Floyd P. Wilcox, Los Angeles, president; Floyd H. White, San Rafael, 1st vice-president; C. E. Wicktor, Los Angeles, 2nd vice-president; A. R. Inman, Visalia, 3rd vice-president; Oscar Kron, San Francisco, treasurer; and Paul D. DeLay, executive committeeman. Mr. Charles S. Travers is permanent secretary.

The banquet in the Crystal Room of the Chase Hotel was enjoyed by members of the Association and of the Women's Auxiliary.

s/CHARLES S. TRAVERS, *Secretary.*

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The University of California.—Harvard, Chicago, Columbia, and California, in that order, are listed as the four greatest universities in the United States. California is the largest institution of learning of all time. It has 43,000 regular, and 200,000 part-time, students, 3,200 scholars and scientists as teachers, 1,500 administrative staff members, 9,000 other full-time employees, an annual budget of $90 million, and 8 campuses scattered from the northern to the southern part of the state. Of these, Berkeley has 23,000 and Los Angeles 14,000 of the regular students. The University was founded in 1869, just twenty years after the Gold Rush.

Connecticut

State Association.—The quarterly meeting of the Connecticut Veterinary Medical Association was held at the Fairfield Hunt Club, Fairfield, on May 4, 1949.

An amendment to the by-laws was passed, adopting a new code of ethics, similar to that approved by the AVMA.

Outstanding speakers were Drs. Raymond Fagan, U.S. Public Health Service: "Animal Reservoirs of Human Diseases"; and Erwin F. Schroeder, chief of staff, the Angell Memorial Animal Hospital, Boston, Mass.: "Practical Surgical Technique for the Reduction and Fixation of Coxofemoral Luxation in the Dog" (with illustrations).

s/E. H. PATCHEN, *Secretary.*

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Dr. Corwin Honored.—Dr. George E. Corwin, 70, of Hartford, who has served as state veterinarian of the Department of Farms and Markets for eighteen years, was honored at a dinner at the Wampanaug Country Club, West Hartford, on June 8, prior to his retirement on July 1.

Dr. Edwin Laitinen, West Hartford, who has known Dr. Corwin for thirty-four years, told of his work in connection with tuberculosis eradication and brucellosis control. "He was one of the very earliest and most persistent advocates of vaccination, starting in the days of the use of bacterins, through the period of attenuated vaccine and now the lyophilized product." He has also been active in state-wide meat inspection service and dog control laws.

Dr. N. W. Pieper, Middletown, was toastmaster at the banquet; Dr. Richard T. Gilyard, Waterbury, presented the gift; and Dr. Charles B. Hines, president of the Connecticut Veterinary Medical Association, spoke on behalf of the Association.

Dr. Corwin is past president of the Connecticut Veterinary Medical Association and was for eight years its secretary. He was vice-president of the U.S. Livestock Sanitary Association and resident secretary of the AVMA.

s/EDWIN LAITINEN, *Resident Secretary.*

Florida

Veterinarian Steals Show from Cowboys at Rodeo.—Dr. Larry Riedel (API '49), Kissimmee, was awarded the unofficial championship by the volume of his winnings at the national Jay Cee convention rodeo in Colorado Springs, Colo., recently. Dr. Riedel plans to establish practice in Lakeland, Fla.

s/V. L. BRUNS, *Secretary.*

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Personal.—The partnership of Drs. H. C. Nichols and E. F. Thomas of Ocala, which has been in successful general practice for several years, terminated on July 1, when Dr. Thomas accepted a position on the faculty of the Georgia School of Veterinary Medicine. Dr Nichols will continue to manage the practice with his associates, Drs. W. R. Brawner, H. L. Gore, and A. R. Chambers. A new hospital, completely equipped for large and small animals, was ready for occupancy early in August.

s/V. L. BRUNS, *Secretary.*

Georgia

State Association.—The forty-third annual meeting of the Georgia Veterinary Medical Association was held on June 12-14, 1949, at the Atlanta Biltmore Hotel in Atlanta. There were 106 veterinarians, 45 women, and 10 students of veterinary medicine in attendance. After President W. D.

Martin, Jr., opened the program, Mrs. A. E. Bott, president of the Women's Auxiliary to the AVMA, addressed the group. The following scientific program was presented.

Dr. J. L. Hopping, Jr., Atlanta: "Ethics."

Dr. A. K. Kuttler, assistant chief, U.S. Bureau of Animal Industry, Washington, D.C.: "Proposed Federal Program for Brucellosis."

The Honorable Tom Linder, commissioner of agriculture, Georgia: "Progress in Georgia."

Dr. C. P. Zepp, Sr., president-elect of the AVMA, New York, N.Y.: "Skin Diseases in Dogs" and "Ear Diseases of Dogs and Cats."

Dr. A. S. Hays, Department of Parasitology, University of Georgia, Athens: "Newcastle Disease."

Dr. R. D. Phillips, Cordele: "Rabies in Georgia."

Dr. Edwin James (Ph.D.), Department of Agronomy, University of Georgia: "Pastures."

Dr. A. H. Quin, Jensen-Salsbery Laboratories, Kansas City, Mo.: "Swine Diseases and Problems."

Col. J. R. Sperry, V.C., U.S. Army, Fort McPherson, Ga.: "Recent Changes in the U.S. Army."

Dr. J. F. Knappenberger, research division, Ashe Lockhart, Kansas City, Mo.: "Cattle Diseases."

Dr. Wilbur Duncan, (Ph.D.), professor of botany, University of Georgia: "Poisonous Plants in Georgia."

Dr. A. H. Quin was moderator of a panel discussion.

The Association, at its business meeting, adopted the *Georgia Veterinarian* as its official organ. This magazine has been issued bi-monthly since the annual meeting in 1948.

Officers for the coming year are Drs. E. E. Chambers, Rossville, president; R. A. Houston, Blakely, president-elect; Chas. C. Rife, Atlanta, reëlected secretary-treasurer.

s/CHAS. C. RIFE, *Secretary.*

Hawaii

Vesicular Disease in Hogs.—The U.S. Bureau of Animal Industry, upon request of Hawaiian officials, sent Dr. Jacob Traum, professor of veterinary research, University of California at Berkeley, to Honolulu to perform differential diagnostic tests on a vesicular disease found in a shipment of hogs held aboard a ship in Honolulu harbor. A number of Hawaiian veterinarians observed the diagnostic techniques used in differentiating the vesicular diseases, as performed by Dr. Traum at the Animal Disease Quarantine Laboratory. Dr. Traum also discussed the progress of the work on foot-and-mouth disease in Mexico.

s/P. T. NOMURA, *Secretary.*

Idaho

Summer Meeting.—The annual summer meeting of the Idaho Veterinary Medical Association was held at the Owyhee Hotel in Boise on June 20-21, 1949. The following scientific program was presented.

Dr. T. R. Myers, U.S. Bureau of Animal Industry, inspector in charge, Idaho station: "Report of Foot-and-Mouth Disease in Mexico."

Dr. J. E. McCoy, Department of Veterinary Medicine, Washington State College, Pullman: "Lameness in Horses," "Sterility in Cattle," "Trench Mouth in the Cat and Dog," and "Digestive Disturbances of Cattle."

Dr. L. C. Moss, head, Small Animal Clinic, Colorado A. & M. College, Fort Collins: "Fractures in Small Animals," "Report of National Small Animal Hospital Association," "Encephalitis Syndrome," and "Skin Conditions in Small Animals."

Dr. B. Keith (Ph.D.), Department of Animal Husbandry, University of Idaho, Boise: "Mineral Deficiency Symptoms of Cattle and Sheep" and "Mineral Deficiencies of Swine."

Dr. L. M. Hurt, Los Angeles, Calif., president of the AVMA: "Idaho's Part in the Los Angeles Milk Supply" and "Policy and Accomplishments of the AVMA."

Dr. J. Gorham, U.S. Bureau of Animal Industry, Washington State College, Pullman: "Common Diseases of Furbearing Animals."

The following officers will be retained for a second term: Drs. E. Don Copple, Boise, president; J. V. Ruebel Jerome, vice-president; and A. P. Schneider, Boise, secretary-treasurer.

s/A P. SCHNEIDER, *Secretary.*

Illinois

New Certified Milk Unit.—Certified milk received a lift in Illinois when the Curtiss Candy Company set apart one of its farms for the production of that class of milk. Farm 711, a part of the Company's 7,500-acre farm skirting Chicago to the northwest, is the site of the venture. The milk is bottled by plants of the Brook Hill Farms, long-time champion of certified milk in the Chicago area. The Curtiss corporation, which made its farming debut in 1942, has herds of four dairy breeds—Holstein-Friesian, Guernsey, Ayrshire, and Brown Swiss (and various breeds of beef cattle

—Courtesy of Certified Milk

Interior view of one of the certified milk barns.

and hogs)—half a million chickens, 20,000 ducks, 1,000 mink, and ponds containing 40,000 trout. It employs two full-time veterinarians, a number of agricultural college graduates, and 350 workers. Its policy is written around "good housekeeping," rigid sanitation, diversified farming, scientific feeding, and preventive medicine—all but a sideline to the production of Baby Ruth (and other) candy bars. Readers who keep informed on purebred dairy cattle will recall the Curtiss champions of the different classes.

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Chicago Association Annual Dinner.—At 6 p.m. on June 14, 1949, members of the Chicago Veterinary Medical Association, their wives, and guests journeyed to the Tam O'Shanter Country Club at Niles for their annual dinner. A full and varied program was planned by the committee which included Drs. and mesdames C. B. Krone, O. Norling-Christensen, R. J. Cyrog, J. R. Robb, R. C. Klussendorf, and A. G. Misener. Gifts, door prizes, and favors for the ladies were contributed by commercial firms.

s/R. C. Glover, *Secretary.*

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Consultation Service Provided by University.—The clinical and diagnostic service of the Department of Veterinary Clinical Medicine of the College of Veterinary Medicine, University of Illinois, will include treatment of privately owned animals, consultation with veterinary practitioners, and hospitalization of animals as follows:

1) Ambulatory clinic calls for the treatment of large animals will be answered within a radius of 20 miles from Urbana by staff members of the Department of Veterinary Clinical Medicine. A fee comparable to that of the local practicing veterinarian will be charged for this service.

2) Consultation service, including x-ray, will be provided on request from practitioners outside the ambulatory clinic area (20 mi. from Urbana). A fee will be charged for the service.

3) Animals (both large and small) will be accepted for hospitalization and treatment. The number of patients accepted for hospitalization will be limited by the availability of hospital space. Blood and urine studies, x-ray and fluoroscopic examinations, and ultra-violet therapy are available for hospital patients.

Practitioners are invited to participate in the program.

s/Robert Graham, *Dean.*

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Veterinary Public Health Committee.—Illinois appears to be the first to take the lead in veterinary coöperation with the public health units forming in the various counties or groups of counties under the federal movement to establish health departments all over the United States. A meeting held in Bloomington formed such a committee at the call of Dean Robert Graham of the School of Veterinary Medicine, University of Illinois. Participating were Drs. N. H. Howlett of the U. S. Bureau of Animal Industry; W. A. Young, managing director of The Anti-Cruelty Society, Chicago; C. E. Fidler, superintendent of the State Division of Livestock Industry; and L. R. Davenport of the State Health Department who serves as chairman of the joint committee of medicine, of veterinary medicine, and of agriculture.

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Dr. Woods Joins Veterinary College Staff.—Dr. George T. Woods (KSC '46) has been appointed assistant professor of veterinary extension at the University of Illinois College of Veterinary Medicine. He was previously engaged in general practice at Shelbyville.

Dr. George T. Woods

After receiving his veterinary degree, Dr. Woods was appointed to the Illinois Department of Agriculture, Division of Livestock Industry, as veterinary field inspector, bovine tuberculosis and brucellosis eradication. Later, he was appointed as veterinarian in charge of the animal house of the Northwestern University School of Medicine. Dr. Woods is a member of the AVMA, the Illinois Veterinary Medical Association, Gamma Sigma Delta, and Phi Kappa Phi.

Indiana

Veterinary Personnel of State Office.—The veterinary personnel of the state veterinarian's office includes Dr. R. W. Elrod, state veterinarian; Glen F. Eichhorn, assistant on tuberculosis-eradication program; Frank W. Douglas, assistant on brucellosis-eradication program; J. R. Martin and S. M. Friedly, field veterinarians; and Mr. Earl Taylor, inspector of rendering plants and sale barns.

s/R. W. Elrod, *State Veterinarian.*

Kentucky

Personal.—Dr. John Wallace Finlay, previously associated with Dr. Boyd Jeffers in Lexington, Ky., has moved to Mexico for a year. He was given an assignment by the government to

work on foot-and-mouth disease control there. His new address is c/o CMAPEFA, Hotel Geneve, Mexico City.

It was erroneously reported in the June JOURNAL that Dr. Finlay was from Lexington, N.Y.

Maine

State Association.— The April meeting of the Maine State Veterinary Medical Association was held in Lucerne. Speakers on the program were: Dr. C. L. Blakely, of the Angell Memorial Animal Hospital, Boston, Mass.: "Anesthesia"; and Dr. J. F. Witter, animal pathologist, University of Maine, Orono: "Recent Important Developments in Medicine."

s/L. B. DENTON, *Secretary*.

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The Eternal Question.—Fifty-four years ago—to be exact, May 6 and July 14, 1896—the state association met to decide whether nongraduate tuberculin tests should be accepted. The Massachusetts Cattle Commission would not accept cattle so tested. In 1949, the state association could not prevent the employment of nongraduates for livestock sanitary police work, joining with Alabama, Colorado, and North Dakota in that respect.—*From the Maine Veterinarian, March* 31, 1949.

Maryland

State Association.—The Maryland State Veterinary Medical Association met on June 16-17, 1949, at the Hotel George Washington in Ocean City. The program follows.

Dr. Robert E. Swope, Live Stock Sanitary Service, University of Maryland, College Park: "Research on Brucellosis."

Dr. Raymond S. Huff, Newton, N.J.: "Some Disease-Control Problems in Routine Dairy Practice."

Dr. C. P. Zepp, Sr., New York City, president-elect of the AVMA: "Ear Diseases of the Dog and Cat" and "Obstinate Skin Diseases of the Dog and Cat."

Dr. Leo J. Poelma, Live Stock Sanitary Service, College Park: "Trichomonas."

Dr. John C. Fowble, Timonium: "Gelfoam an Absorbable Gelatine Sponge" (with illustrations).

Major W. Wallenstein, V.C., College Park: "Rh Factor in Horses."

Dr. F. L. Vinson, Baltimore: "Reduction and Pinning of Coxofemoral Articulation."

The new officers of the Association are Drs. C. L. Everson, College Park, president; H. L. Baker, Hagerstown, vice-president; J. Walter Hastings, Sr., Cambridge, secretary-treasurer; F.S. Wharton, Centerville, board of directors; John Gadd, A. B. Armstrong, and Leo J. Poelma, public relations; and John Fowble, ethics.

s/J. WALTER HASTINGS, SR., *Secretary*.

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Personal.—Dr. J. R. M. Innes has accepted an award of a special research fellowship, by the U.S. Public Health Service, Division of Mental Science, at the Microbiological Institute, National Institutes of Health, Bethesda, Md. The project will include work on the use of homologous and heterologous brain emulsions, experimental production of demyelination encephalopathy in lambs and dogs, and pathology and pathogenesis of virus diseases of dogs.

Massachusetts

State Association.—The regular monthly meeting of the Massachusets Veterinary Association, on May 18, was held in the Paige Laboratory, University of Massachusetts, Amherst. The following motion pictures (in color) were shown: "Battling Brucellosis," "Vesicular Diseases of Animals," "Suppressing Foot-and-Mouth Disease," and "Phenothiazine and Its Uses." Dr. C. Lawrence Blakely, Department of Surgery, the Angell Memorial Animal Hospital, Boston, spoke on "The Prevention and Management of Some Anesthetic Emergencies." Drs. B. S. Killian, Boston, and F. M. Austin, Belchertown, discussed this subject.

s/C. LAWRENCE BLAKELY, *Secretary*.

Michigan

Dr. Segal Speaks at Farm Institute.—Dr. Dorothy Segal (MSC '43), Lapeer, was guest speaker at the Harrisville Veteran's Farm Institute in Harrisville on June 15, 1949. Dr. Segal spoke on "The Problems of Brucellosis in Man and Animals," conducted a lengthy question and answer session, and demonstrated the rapid agglutination plate test and its application in the field.

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Drs. Davidson and Correll Speak at Veterinary Colleges.—Dr. J. L. Davidson, Department of Veterinary Medicine, and Dr. John T. Correll (Ph.D.), Research Department, Upjohn Company, Kalamazoo, visited several southern veterinary colleges in May. They spoke before student meetings at the University of Georgia, Athens; Tuskegee Institute, Tuskegee, Ala.; and Alabama Polytechnic Institute, Auburn.

Missouri

Sedalia in Grand Circuit.—Says the *Harness Horse*, "We welcome Sedalia into the Grand Circuit this year." The races will be run in connection with the State Fair, August 22-26. The estimated purses will be $86,500, two of which are for $5,000 each.

Montana

State Association.—The thirty-ninth annual meeting of the Montana Veterinary Medical Association was held in Helena on June 22-23, 1949. The following program was presented:

Dr. Lee Seghetti, associate pathologist, Veterinary Research Laboratory, Montana Experiment Station, Bozeman: "The Internal Parasite Problem of Montana Livestock."

Dr. H. E. Kemper, inspector in charge, Zoölogical Division, Bureau of Animal Industry, Albuquerque, N. M.: "The Control of Ectoparasites of Livestock with the Newer Insecticides" and " Filarial Dermatosis of Sheep."

Dr. L. M. Hurt, Los Angeles, Calif., president of the AVMA: "The American Veterinary Medical Association" and "The Disease Control Problems Encountered in County Livestock Inspection."

Dr. W. L. Jellison, parasitologist, National Institutes of Health, U. S. Public Health Service, Hamilton: "Resumé of Q Fever Studies in Southern California, September, 1946, to December, 1948."

Dr. H. G. Stoenner, senior assistant veterinarian, National Institutes of Health, U. S. Public Health Service, Hamilton: "Q Fever in Dairy Cattle."

Dr. H. F. Wilkins, state veterinarian, and G. W. Cronen, inspector in charge, U. S. Bureau of Animal Industry, Helena: "Official Disease Control Work."

Dr. Hadleigh Marsh, director, Veterinary Research Laboratory, Bozeman: "Report of the Veterinary Research Laboratory."

New officers of the Association are Drs. G. A. Morrison, Great Falls, president; H. W. Jacobson, Havre, vice-president; E. A. Tunnicliff, Bozeman, secretary-treasurer. New members of the Executive Board are Drs. R. D. Read, Ronan; F. L. Metcalf, Missoula; G. C. Halver, Glendive; G. A. Morrison; H. W. Jacobson; and E. A. Tunnicliff. J. W. Safford will again represent the Association as the House of Representatives' delegate, with E. M. Joneschild as alternate.

s/E. A. TUNNICLIFF, *Secretary.*

New York

State Association.—The fifty-eighth annual meeting of the New York State Veterinary Medical Society was held at the Hotel Statler, New York City, on June 22-25, 1949. The scientific program follows.

Dr. Raymond Fagan, Harvard School of Public Health, Boston, Mass.: "Brucellosis in Human Beings and Animals."

Dr. Joseph F. Knappenberger, field representative for Ashe Lockart, Kansas City, Mo.: "Digestive Disorders in Cattle."

Dr. Raymond E. Meek (M.D.), ophthalmologist, New York City: "Therapeutics of the Eye."

Dr. Wilson R. Haubrich, Claremont, N.H.: "Sterility in Cattle."

Dr. Alexander Zeissig, in charge of rabies control, Albany: "The Rabies Situation in New York State."

Dr. Charles C. Rife, Atlanta, Ga.: "Veterinary Economics in Small Animal Practice."

Dr. H. K. Fuller, Interlaken: "Veterinary Economics in Large Animal Practice."

Dr. C. P. Zepp, Sr., president-elect (now president), AVMA, New York City: "Obstinate Skin Diseases" (with illustrations).

Dr. James Farquharson, director of clinics, Colorado A. & M. College, Fort Collins: "Surgery on Small Animals," "Surgical Repair of Rupture of Penis in the Bull," and "Lameness of the Thoroughbred" (all illustrated).

Dr. Joseph B. Engle, Summit, N.J.: "Hospital Management."

Dr. Joseph A. S. Millar, Deal, N.J.: "Surgical Management of Mammary Tumors."

Dr. Robert Kirk, Kensington, Conn.: "Cataract Operation in the Dog" (with illustrations).

Dr. H. C. Stephenson, New York State Veterinary College, Cornell University, Ithaca: "Granuloma of the Tongue" (with illustrations).

Dr. J. Stuart Crawford, New Hyde Park, Long Island: "Pre- and Postnatal care of the Bitch."

Dr. Irving E. Altman, Brooklyn: "Diseases of Newborn Pups."

Dr. Arthur Trayford, Huntington, L.I.: "Geriatrics."

Dr. George H. Hopson, DeLaval Company, New York City: "The Practical Aspect of Physical Examination of Dairy Cattle."

Dr. James M. Delaney, Mt. Holly, N.J.: "The Use of Some Therapeutic Agents in Mastitis."

Dr. S. E. Southhard, Belmont Park, N.Y., and Hialeah Park, Miami, Fla.: "Equine Therapeutics."

Dr. Walter J. Gibbons, Alabama Polytechnic Institute, Auburn: "The X Disease Complex" (with illustrations).

Dr. Stephen J. Roberts, New York State Veterinary College: "Obstetrical Problems."

s/J. J. REGAN, *Secretary.*

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New York City Association.—The regular meeting of the Veterinary Medical Association of New York City, Inc., was held at the Hotel Statler, Wednesday, May 4, 1949.

Colonel Raymond Randall, V. C., Army Medical Department, Research and Graduate School, Army Medical Center, Washington, D. C., spoke on "Canine Leptospirosis." The subject was brought up to date including diagnosis, immunization, and treatment with the newer antibiotics.

Dr. Herman R. Siebold, pathologist, Pathological Division, Bureau of Animal Industry, USDA, Washington, D. C., spoke on "Canine Histoplasmosis." It became apparent that the incidence of this disease may be greater than was heretofore supposed.

Drs. Leonard Ferber, Bayside, N. Y., and Sperry Kinton, Lebanon, N. J., were announced as new members of the Association.

s/C. R. SCHROEDER, *Secretary.*

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National Dog Week.—Arthur Godfrey, foremost commentator of the radio and video is the general chairman of National Dog Week, September, 18-24. On his advisory committee are Dr. Harold Groth, Gabriel Heatter, and Dr. C. P. Zepp, Sr., president of the AVMA.

North Carolina

State Association.—The forty-eighth annual meeting of the North Carolina State Veterinary

Medical Association was held at the Bame Hotel, Carolina Beach, on June 28-29, 1949. The following program was presented.

Dr. H. T. Farmer, Richmond, Va.: "Animal Restraint."

Dr. J. L. Davidson, Upjohn Co., Kalamazoo, Mich.: "Control of Hemorrhage with Gelfoam" (with illustrations).

Dr. T. J. Jones, dean, School of Veterinary Medicine, University of Georgia, Athens: "Progress of the Georgia Veterinary College" and "Cattle Practice."

Dr. L. M. Greene, Raleigh: "The Veterinarian's Place in the Poultry Industry."

Dr. J. H. Knapp, Columbus, Ohio: "Skin Diseases of Small Animals" and "Business Methods and Management of Small Animal Hospitals."

Dr. M. L. Morris, consultant in animal nutrition, New Brunswick, N.J.: "Nutritional Therapy in Small Animal Practice" (with illustrations) and "Small Animal Practice."

s/J. H. BROWN, *Secretary.*

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Roanoke-Tar Association.—The Roanoke-Tar Veterinary Association met on June 3, 1949, in Goldsboro, with 25 veterinarians and their wives in attendance. A lively round-table discussion was held on "Veterinary Ethics," with all members participating. Officers of this association are Drs. C. R. Swearingen, Smithfield, president, and J. C. Allen, Rocky Mount, secretary.

s/J. H. BROWN, *Resident Secretary.*

North Dakota

State Association.—The forty-fourth annual meeting of the North Dakota Veterinary Medical Association was held at the Townhall-Gardner Hotel, Fargo, on June 13-14, 1949. The following program was presented.

Dr. L. E. Harris, Lincoln, Neb.: "Veterinary Diagnostic Methods" and "The Veterinarian as an Expert Witness."

Dr. T. O. Brandenburg, Bismarck: "State Veterinarian's Report" and "X Disease in Cattle" (with illustrations).

Dr. T. V. Miles, Ellendale: "What I Consider Proper Sale Ring Inspection."

Dr. Fred M. Shigley, Bismarck: "Disease Control and Disease Eradication" and "Foot-and-Mouth Disease" (with illustrations).

Dr. S. H. McNutt, Madison, Wis.: "Brucellosis of Swine" and "Swine Erysipelas."

Dr. J. W. Cunkleman, Fort Dodge, Iowa: "Medication of Swine" and "Abortion in Ewes."

Dr. F. M. Bolin, Fargo: "Demonstration of Swine Bleeding."

Officers elected were Drs. J. A. Foss, Minot, president; D. A. Wire, Valley City vice-president; and T. O. Brandenburg, secretary-treasurer.

s/FREDERIK LOW, *Resident Secretary.*

Ohio

North Central Association.—The North Central Veterinary Medical Association met in Marion on May 24, 1949. The subject for discussion was "Better Public Relations." Members planned educational exhibits for county fairs to be held in north central Ohio.

s/C. R. COLE, *Resident Secretary.*

Puerto Rico

Sociedad Insular.—The *Sociedad Insular de Medicos Veterinarios* held its annual meeting on June 4-5, 1949, in the Insular Department of Agriculture and Commerce Building at Santurce, P.R.

The scientific program was as follows.

Dr. D. Rivera Anaya, Insular Experiment Station veterinarian, Rio Piedras: "Veterinary Research at the Insular Experiment Station."

Dr. Carlos J. Cardona, Hato Rey: "Private Large Animal Practice."

Dr. O. A. Lopez-Pacheco, Hato Rey: "Radiographic Interpretations of Different Techniques of Fracture Reduction in Small Animals."

Dr. Herbert Gomez, Santurce: "Veterinary Practice in the Dominican Republic."

Dr. Luis Montanez-Rivera, San Juan: "Autopsy of Tuberculous Reactors" (with illustrations).

The following officers were elected: Drs. César Clavell, veterinarian-in-charge, Bureau of Animal Industry, San Juan, president; Jaime Bágue, Santurce, vice-president; Francisco Santiago, San Juan, secretary-treasurer.

The name of the Association was changed to *Asociación Médico Veterinaria de Puerto Rico.*

s/O. A. LOPEZ-PACHECO, *Resident Territorial Secretary.*

Rhode Island

State Officers.—At the annual meeting of the Rhode Island Veterinary Medical Association in Providence, Jan. 12, 1949, the following officers were elected: Drs. Ralph Povar, East Providence, president; Ray M. Batchelder, Kingston, president-elect; and J. S. Barber, Pawtucket, reëlected secretary-treasurer.

s/J. S. BARBER, *Secretary.*

Texas

Conference for Veterinarians.—The second annual conference for veterinarians of the School of Veterinary Medicine, A. & M. College of Texas, College Station, was held at the College on June 9-10, 1949. The literary program follows. All speakers not otherwise identified are members of the faculty of the College.

Dr. H. T. Barron: "Bovine Obstetrics."

Dr. B. S. Pomeroy, Department of Veterinary Medicine, University of Minnesota, St. Paul: "Sulfonamides in Poultry Diseases."

Dr. J. H. Steele, chief, Veterinary Public Health Division, medical director in charge, Communicable Disease Center, Atlanta, Ga.: "The Veterinarian in Public Health."

Dr. N. B. Tennille, head, Department of Animal Surgery, Oklahoma A. & M. College, Stillwater, Okla.: "Hospital Management" and "Surgical Methods."

Mr. Arthur Stewart, lawyer and instructor, Department of Business and Accounting, A. & M. College of Texas: "Veterinary Law."

Dr. A. V. Young, Shreveport, La.: "Show Cattle Surgery."

Dr. J. R. Ludwigs, chief veterinarian, Livestock Sanitary Commission of Texas, Fort Worth: "The Livestock Sanitary Commission."

Dr. A. B. Rich, director of laboratory, State Health Department, San Antonio: "Q Fever."

Dr. W. V. Lumb: "Fracture Management."

Dr. W. A. Boney, Jr.: "Poultry Research."

s/I. B. BOUGHTON, *Dean.*

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Dr. Dale Joins Staff of Veterinary School.—Dr. H. E. Dale (ISC '44) has joined the staff of the School of Veterinary Medicine, Texas A. & M. College, as assistant professor in the Department of Physiology and Pharmacology.

Dr. Dale served in the army from March, 1945, to March, 1946. From March, 1946, to August, 1947, he was assistant state veterinarian for Illinois, and was graduate assistant in the Department of Physiology at Iowa State College from September, 1947, to June of this year, when he assumed his duties at Texas A. & M. College.

Vermont

The Busiest Cowboy.—The busiest cowboy rides fences, not in the mesquite country, but in New England. He is H. W. Norton, Jr., of Brattleboro, keeper of the herdbook and executive secretary of the Holstein-Friesian Association of America which has a membership of over 39,000. Last year's "Report of Officers and Committees" shows a registration of 168,338 head in 41 states and Puerto Rico and the transfer of 112,957 certificates, not to mention the admission of 1,348 new members. "The greatest year in the history of the organization" is the score. Although located at the far northeastern edge of the black-and-white empire, the cowboys of Brattleboro continue to render yeoman service to America's livestock industry, in general, and to the largest cattle association, in particular.

s/LIFE MEMBER, *Retired.*

Wisconsin

Feed Industry Holds Large Meeting.—The National Feed Industry Show, held concurrently with the annual meeting of the Central Retail Feed Dealers Association at Milwaukee, June 8-9, brought together the largest gathering of feed men in all history. Although the Central Association is a Wisconsin organization, it has taken on the stature of a national body in recent years, particularly in connection with dairy-cattle feeds. In view of the rapid development of the commercial feed industry, interest in such conventions by veterinarians is understandable.

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Personal.—Dr. T. T. Chaddock has resigned as veterinary director of Fromm Laboratories, Inc., Grafton. Dr. Chaddock, now at Port Washington, Wis., states that his services will continue to be available to the fur industry.

Wyoming

State Association.—The annual meeting of the Wyoming Veterinary Medical Association was held in Laramie on June 19-20, 1949. Approximately 30 veterinarians attended.

The following men appeared on the program:

Dr. E. S. Norton, Lander, led a round table discussion on "Brucellosis Control."

Dr. William Lynch, Cedar Rapids, Iowa: "Swine Diseases."

Dr. Rodney Port, Sundance: "Spaying of Heifers—Discussion and Demonstration."

Dr. H. E. Kingman, Wyoming Hereford Ranch: "Ova Implantation."

Dr. H. B. Brown, Colorado Springs, Colo.: "Use of Parenteral Solutions in Small Animal Therapy."

Dr. Robert Pierson, Saratoga: "Lantern Slides of Interesting Cases."

Dr. D. R. Mackey, Greeley, Colo., and Dr. B. N. Frank, Sterling, Colo.: "Bovine Obstetrical Problems."

Newly elected officers are Drs. P. E. Madsen, Sheridan, president; Dr. V. J. Humphrey, Worland, vice-president; Dr. Jo Browne, Laramie, secretary-treasurer.

s/JO BROWNE, *Secretary.*

FOREIGN NEWS

Corsica

War-Borne Rabies.—Outbreaks of rabies in dogs, foxes, and cattle followed the passage of Allied troops in April, 1944, and continued to rage through 1946. There were no human cases. Control by canine vaccination was hindered by the large number of foxes on the island. No cases occurred in vaccinated dogs or cattle. Despite the distribution of free ammunition to kill foxes, the situation (as of January, 1949) remained unfavorable.

England

Fellowship for Freedom in Medicine.—The Fellowship for Freedom in Medicine, a new society, headed by Lord Horder and duly registered to transact business, has enrolled a membership of 2,200 physicians to work, not for repeal, but for amendments to the National Health Service Act which, even the government admits, has some objectionable features. Certain benefits, especially in connection with hospitals are admitted by the new society but the possibility of making full-time servants out of physicians is denounced as an encroachment on the freedom of medicine and a detriment to its progress.—*J. Am. M. A., Apr.* 9, 1945.

France

Foot-and-Mouth Disease Laboratory Opened.—A new vaccine-producing laboratory, known as *l'Institut Francais de la Fièvre Aphteuse*, was officially opened at Lyon on May 15, 1949. It is adjacent to the Lyon abattoirs and is capable of handling 250 cattle each week in the production of aluminum hydroxide foot-and-mouth disease vaccine (*Veterinary Record*, May 28, 1949). Cattle

shipped for slaughter are inoculated, and the tongues are removed twenty-four hours later for vaccine production. The rest of the carcass is used for meat purposes after a 48-hour period of chilling that inactivates the virus. Although the institute is under control of the veterinary service of the French Ministry of Agriculture, two private research organizations have a part in its management. Dr. H. Girard, a veterinarian, is director of the institute.

Germany

Ascariasis Increasing.—A notable increase of ascarid infections was reported in the region of Hanover, where upward of 33 per cent of school children and many adults were found to be heavily infected. Gastrointestinal operations revealed appendicitis, pancreatitis, cholangitis, and gastroduodenal troubles due to ascarid migration in the oral direction. Anthelmintic treatment caused ascarids to clump and to commence migrating upward within the alimentary canal as far as the mouth. Vomiting worms was common. Hands soiled in gardening contaminated soil and soil-contaminated vegetables account for the extraordinary incidence of ascariasis. [An interesting observation which may be useful in veterinary medicine is that the administration of hydrochloric acid with the anthelmintic prevents the clumping and migration of ascarids.]—*Medizinische Klinik, Munich, Sept. 1948.*

Japan

Damaged Hides Reduce Leather Production.—Nicks, knife cuts, and accumulated filth are making nearly 75 per cent of all hides in Japan unsuitable for economical production of good leather, the Veterinary Affairs Division of General MacArthur's headquarters has reported.

Philippine Islands

Annual Convention.—The twenty-sixth annual convention of the Philippine Veterinary Medical Association was held April 22-23, 1949, at the University of the Philippines, Diliman, Quezon City. It was the first meeting of the Association since the liberation of the Islands and was attended by veterinarians from all of the Islands. The scientific program follows.

Drs. J. D. Generoso and I. L. Mendoza, Bureau of Animal Industry: "Observations on the Use of Mukteswar Strain of Avian Pest Virus as a Vaccine in the Philippines."

Dr. A. Gonzaga, College of Veterinary Medicine, University of the Philippines: "Systemic Alkalinization with Sodium Bicarbonate in the Treatment of Colds of Horses."

Drs. E. S. Salafranca, Bureau of Animal Industry, and L. Espiritu (M.D.), Institute of Hygiene: "A Report on the Presence of Japanese B Encephalitis Neutralizing Antibody Among Filipinos and Certain Philippine Animals."

Dr. T. T. David, College of Veterinary Medicine: "Plastics in Biological Specimens for Study and Display."

Dr. V. M. Zaratan, Bureau of Animal Industry: "Bringing Veterinary Service to the People."

Dr. J. B. Uichangco, College of Veterinary Medicine: "The Effect of Splenectomy on the Resistance of White Rats to Anthrax."

Dr. Z. de Jesus, College of Veterinary Medicine; D. J. Cabrera, Malaria Control Division, U.S. Public Health Service; and F. Z. Gonzales, Veterinary Division, City of Manila: "A Report of Experiments on the Control of Surra."

Dr. F. San Agustin, Bureau of Animal Industry: "Swine Brucellosis in the Philippines with Special Reference to Imported Stock."

Dr. L. M. Yutuc, College of Veterinary Medicine: "Observations on the Incidence of Tabanids with Surra Transmission."

Dr. T. M. Capulong, Disease Control Division, Bureau of Animal Industry: "Notes and Observations on the Mass Vaccination of Hogs Against Hog Cholera with the Use of the Simultaneous Method."

Dr. M. Baluyot, Hacarin Dairy Farm: "Necrobacillosis—Its Treatment and Control."

Drs. P. G. Refuerzo, Veterinary Research Division, and E. E. Acasio, Animal Husbandry Division, Bureau of Animal Industry: "Keratitis (Pink Eye) of Cattle—Its Treatment."

The following officers were elected: Drs. Angel K. Gomez, dean, College of Veterinary Medicine,

Newly elected officers of the Philippine Veterinary Medical Association are (left to right): Dr. Zacarias de Jesus, vice-president; Dr. Angel K. Gomez, president; and Dr. Tomas T. David, secretary-treasurer.

University of the Philippines, Diliman, Quezon City, and member of the AVMA, president; Zacarias de Jesus, head, Department of Veterinary Parasitology and Protozoölogy, University of the Philippines, vice-president; and Tomas T. David,

head, Department of Veterinary Anatomy, secretary of the College and member of the AVMA, secretary-treasurer.

s/Jose B. Aranez, *Resident Secretary.*

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Commencement.—The College of Veterinary Medicine, University of the Philippines, Diliman, Quezon City, granted degrees of veterinary medicine to 11 students at its thirty-fifth commencement exercises this year. Two of the graduates were from India.

s/Jose B. Aranez, *Resident Secretary.*

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Veterinarian Honored Posthumously.—Dr. Teodulo Topacio (PHIL '15), with degrees of M.S. from Washington State College, and D.S. from Johns Hokpins University, Baltimore, Md., was posthumously honored as a doctor, scientist, savior of Philippine animal industry, and distinguished alumnus at the University faculty-alumni banquet on Feb. 11, 1949.

Dr. Topacio won scientific fame for his researches on rinderpest vaccine, methods of control of surra, hemorrhagic septicemia, anthrax, rabies, and hog cholera.

s/Jose B. Aranez, *Resident Secretary.*

Portugal

Antirabic Vaccination of Dogs.—Observations of the last thirty years have proved the value of vaccinating dogs against rabies. In 1926, 4,600 bitten persons were given the Pasteur treatment. By 1934, the number dropped to 350 treated persons, owing to the extensive vaccination of dogs. On account of a decline in vaccination, there was a slight increase in 1939. The resumption of canine vaccination practically eradicated the disease by 1945. The only cases reported in that year were attributed to stray dogs along the Spanish border. —*From Vet. Bull., Jan.*, 1949.

Russia

Soviet Three-Year Livestock Plan.—The Russian government has announced initial provisions of a new three-year plan for a 50 per cent increase in livestock production, according to British news sources (*Vet. Rec.*, May 7, 1949).

Higher wages, with the award of the title of "hero of Socialist labor" in outstanding cases, are provided under that part of the decree dealing with increased cattle production. The order of the Red Banner will be awarded for 20 years of service in cattle breeding, and the order of Lenin for 25. Incentives also are provided for boosting production in other species of livestock.

All engaged in cattle breeding may retire at the age of 50 on a 50 per cent pension, but if they continue to work after that age, they will receive full wages in addition to the pension. Every type of worker in the cattle-breeding industry comes under the decree, including veterinarians attached to breeding farms.

Aim of the decree is to stop the "lagging behind" in cattle breeding and to produce more meat, fats, eggs, dairy products, leather, and wool urgently needed by the Russian economy.

Saipan Island

In Vivo Poisoned Meat.—A serious case of mass food poisoning among 57 Filipino banqueteers, of whom 45 were stricken, 20 rendered unconscious, and 7 near death, was traced to the flesh of a fresh-killed eel that had been rendered toxic *in vivo* by feeding on toxiferous shellfish. The incident brings up the question of food poisoning from an anteslaughter toxicosis, simulating, for example, milk sickness caused by consuming the milk, butter, or flesh of cattle that browse on an injurious plant —white snakeroot. The eel in question here browsed on shellfish and poisoned the consumer of its flesh.

VETERINARY MILITARY SERVICE

Veterinarians at Work.—Under this title, an illustrated article in the *Army Information Digest* (March, 1949) paid tribute to the wartime and postwar accomplishments of the Veterinary Corps. "With the advent of atomic and biologic methods of warfare, the role of Army veterinarians becomes doubly important," the article stated.

MARRIAGES

Dr. F. M. Ward (TEX '48), Garland, Texas, to Miss Lee Kirkpatrick, Greenville, Texas, on Dec. 31, 1948.

Dr. Gifford Hargis (TEX. '43), Opelousas, La., to Miss Helen McAdams, Baton Rouge, La., on Feb. 13, 1949, in Baton Rouge.

Dr. Parke Brewster Johnston (OSU '45), Madeira, Ohio, and Mary Phyllis Madden, daughter of Dr. and Mrs. A. G. Madden, Madeira, Ohio, on June 18, 1949.

BIRTHS

Mr. and Mrs. R. P. Reiley (Helen L. Forsythe WASH '41), Olympia, Wash., announce the birth of twins, Robert Patrick, Jr., and Sharon Ann, on Nov. 3, 1948.

To Dr. (API '43) and Mrs. Howard T. Weir, Jr., Chester Heights, Pa., a son, Howard Twaddle Weir, III, on May 9, 1949.

Dr. (WASH '44) and Mrs. A. W. Elting, Miles City, Mont., announce the birth of Clayton Ross' baby sister, Paula Jan, on May 16, 1949.

Dr. (UP '39) and Mrs. Howard D. Sackett, Roanoke, Va., announce the birth of Bruce Wellington on May 17, 1949.

Dr. (ISC '49) and Mrs. LaVerne E. Witt, Sidney, Mont., announce the birth of their second child, Sandra Ruth, on June 18, 1949.

To Dr. (OSU '43) and Mrs. William H. Newton, Lemont Furnace, Pa., a son, Joseph Michael, on June 18, 1949.

Dr. (CORN '47) and Mrs. E. Irvin Neserke, Baltimore, Md., announce the birth of a daughter, Donna Lee, on June 30, 1949.

DEATHS

Chas. E. Broad (ONT '95), Crown Point, Ind., died Jan. 29, 1949.

W. A. Carter (USCVS '18), 58, Weldon, N. Car., died at his home on June 4, 1949, after a lingering illness. Before his death, Dr. Carter had sold his small animal hospital to Dr. B. H. Brow (API '47). Dr. Carter was a past president of the North Carolina Veterinary Medical Association and had been a member of the AVMA.

Roy L. Collins (MC K '17), 55 Kingston, N. Y., died June 24, 1949, of a heart condition. Dr. Collins was in meat inspection in Boston from July, 1919, to May, 1927, when he joined his brother in practice. He reëntered meat inspection in 1944 and was transferred to Kingston, N. Y., where he remained until his death. Dr. Collins was a member of the Massachusetts Veterinary Medical Association and of the National Association of Federal Veterinarians. He is survived by his wife and two daughters. He had been a member of the AVMA.

★**George A. Ellmers** (UP '44), 28, Paramus, N. J., died on June 15, 1949. He had served in World War II and was engaged in general practice in Paramus at the time of his death. He is survived by a brother Gordon (UP '41). Dr. Ellmers was a member of the AVMA.

★**Arthur James Glover** (MINN '99), 76, Fort Atchinson, Wis., died on May 8, 1949. Retired editor of *Hoard's Dairyman* and honorary member of the AVMA since 1920, Mr. Glover was a celebrated educator and organizer in the livestock field. He was honored by the AVMA for backing national bovine tuberculosis eradication when opinion on that subject was by no means unanimous in the agricultural press. He opposed the Russell plan of turning tuberculin testing over to laymen as is now being done in the case of brucellosis. He was a relentless critic of incompetent veterinarians and a booster for the capable, but was honored by the veterinary profession mostly for holding out wholesome milk as a means of promoting the interests of the dairy farmers.

Horace M. Gohn (ONT '93), Saint Johns, Mich., died May 1, 1949. Dr. Gohn retired ten years ago. He had been a member of the AVMA.

★**John P. Iverson** (SAN FRAN '06), Oakland, Calif., died early in 1949. Dr. Iverson was for many years chief of market and food inspection in Oakland. He was a member of the AVMA for thirty-eight years.

★**Samuel M. Langford** (ONT '12), 60, Martinsburg, W. Va., died in 1948. Dr. Langford was a member of the West Virginia Veterinary Medical Association and was admitted to the AVMA in 1915.

Leroy F. Nisley (KCVC '18), 57, Gothenburg, Neb., died on March 17, 1948. Dr. Nisley had been a member of the AVMA.

Jasper S. Potter (CVC '92), 80, Iowa City, Iowa, died at his home on June 27, 1949, after an illness of several months. Dr. Potter had practiced in Iowa City for more than fifty years. His wife, a son, and a daughter survive him. He had been a member of the AVMA.

★**Shamseldin Halfawi Rached** (CAIRO '37), 34, East Lansing, Mich., died, as the result of an accident, on April 23, 1949. His wife, *née* Adria Sadek, of Cairo, survives him. Dr. Rached was a member of the Egyptian Veterinary Medical Association, the Royal Zoölogical Society of Egypt, and was admitted to the AVMA in 1946.

Robert O. Rothermel (UP '02), Reading, Pa., died April 18, 1949. Dr. Rothermel had been employed by the Pennsylvania state Bureau of Animal Industry.

J. A. Schaefer (GR RAP '13), Bangor, Mich., died May 28, 1949. Dr. Schaefer had been engaged in general practice.

Otto W. Schubel (USCVS '11), Quincy, Mich., died on April 19, 1949.

Hugh Simpson (ONT '17), Harriston, Ontario, died. The date of his death is not known. Dr. Simpson was engaged in general practice.

★**Howard H. Sparhawk** (OSU '07), 64, Akron, Ohio, died May 15, 1949, of a cerebral hemorrhage. Dr. Sparhawk was chief veterinarian for the city of Akron and had been affiliated with both federal and local government work throughout his forty-two years as a veterinarian. He also conducted a large general practice. Dr. Sparhawk was admitted to the AVMA in 1917.

★**Ernest R. Sparks** (KCVC '09), 64, Pomona, Calif., died on March 28, 1949. Dr. Sparks was a member of the Southern California Veterinary Medical Association, the California State Veterinary Medical Association, and of the AVMA.

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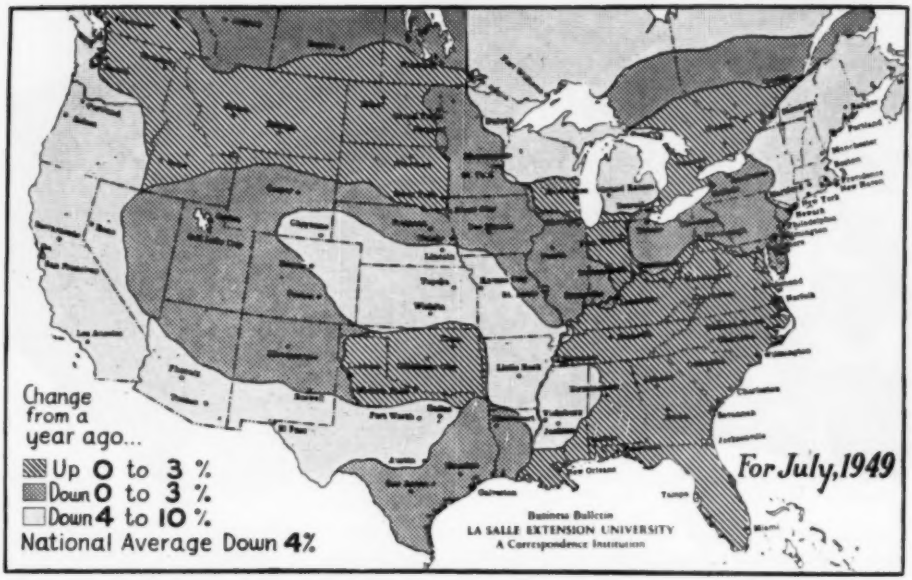

Business activity has continued to slow down but the rate remains high as compared with all previous periods except the unusually high peaks of last year. As usual, variations among different industries are wide and among many the drop has been marked. Variations among different sections of the country are not so striking, and in several places the shadings on the map reflect the unusual rise last year rather than a major falling off this year. In spite of extensive readjustments which are taking place, business remains on a high plateau with the top tilting quite definitely downward.

Crop prospects are good throughout the Middle West, but lower prices are reducing farm income and thus causing some slowing down in business activity.

Canadian business and industrial operations are holding up somewhat better than those in the United States. The trend has been gradually upward since shortly after the first of the year and production is now a little above that of a year ago. Current indications are favorable for good crops and high farm income in spite of lower prices. Purchasing power is high and the demand for industrial as well as farm products appears large enough to sustain a high level of business volume.

COMING MEETINGS

Kentucky Veterinary Medical Association. Summer meeting. Seelbach Hotel, Louisville, Ky., Aug. 17-18, 1949. Ross Brown, University of Kentucky, Lexington, Ky., secretary.

Georgia Coastal Plain Experiment Station. Annual short course for veterinarians. Coastal Plain Experiment Station, Tifton, Ga., Sept. 12-13, 1949. Wm. L. Sippel, Georgia Coastal Plain Experiment Station, Tifton, Ga.

Virginia Veterinary Medical Association. Fall meeting. Cavalier Hotel, Virginia Beach, Va., Sept. 12-14, 1949. H. K. Royer, Lynchburg, Va., secretary.

Mississippi, Northeast Veterinary Medical Association. Annual clinic. Corinth, Miss., Sept. 13, 1949. Price S. Livingston, New Albany, Miss., secretary.

Tennessee, University of, College of Agriculture. Short course for veterinarians, University of Tennessee, Knoxville, Sept. 15-16, 1949. Dennis Sikes, Department of Veterinary Science, University of Tennessee, College of Agriculture, Knoxville, Tenn.

(Continued on page 28)

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(Continued from page 26)

Colorado State Veterinary Medical Association. Annual meeting. Shirley Savoy Hotel, Denver, Colo., Sept. 29-30, 1949. W. P. Blake, 2410 8th Ave., Greeley, Colo., secretary.

South Dakota Veterinary Medical Association. Annual meeting. Sioux Falls, S. Dak., Oct. 5-6, 1949. R. M. Scott, 1501 S. Maine Ave., Sioux Falls, S. Dak., secretary.

Pennsylvania State Veterinary Medical Association. Annual meeting. Bedford Springs Hotel, Bedford Springs, Pa., Oct. 5-7, 1949. Raymond C. Snyder, Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Purdue University. Annual short course for veterinarians. Department of Veterinary Science, Lafayette, Ind., Oct. 5-7, 1949. C. R. Donham, head, Department of Veterinary Science, Purdue University, Lafayette, Ind.

Chief Livestock Sanitary Officials. National Assembly. The Neil House, Columbus, Ohio, Oct. 10-11, 1949. Dr. C. F. Clark, State Office Building, Lansing 13, Mich., secretary.

United States Livestock Sanitary Association. Annual meeting. The Neil House, Columbus, Ohio, Oct. 12-14, 1949. Dr. R. A. Hendershott, 1 West State St., Trenton 8, N. J., secretary.

New England Veterinary Medical Association. Annual meeting. Poland Spring House, Poland Spring, Maine, Oct. 18-19, 1949. A. E. Coombs, 15 Elm St., Skowhegan, Maine, president.

Iowa, Eastern Veterinary Medical Society. Annual meeting. Hotel Montrose, Cedar Rapids, Oct. 20-21, 1949. Laurance P. Scott, P. O. Box 325, Waterloo, Iowa, secretary.

Florida State Veterinary Medical Association. Annual meeting. Hotel George Washington, Jacksonville, Fla., Oct. 23-25. 1949. V. L. Bruns, Box 623, Williston, Fla., secretary.

American Public Health Association. Annual meeting. Hotels Statler and New Yorker, New York City, Oct. 24-28, 1949. Dr. Reginald Atwater, American Public Health Association, 1790 Broadway, New York, N. Y., executive secretary.

Mississippi Valley Veterinary Medical Association. Annual fall meeting. Pere Marquette Hotel, Peoria, Ill., Nov. 2-3, 1949. R. J. Kirkpatrick, 1235 N. Henderson St., Galesburg, Ill., secretary.

Southern Veterinary Medical Association. Annual meeting. Thomas Jefferson Hotel, Birmingham, Ala., Nov. 7-9, 1949. A. A. Husman, 320 Agricultural Bldg., Raleigh, N. Car., secretary.

Nebraska State Veterinary Medical Association. Annual meeting. Cornhusker Hotel, Lincoln, Neb., Dec. 7-9, 1949. L. V. Skidmore, College of Agriculture, Lincoln 1, Neb., secretary.

Ohio State Veterinary Medical Association. Annual meeting. The Deshler-Wallick Hotel, Columbus, Jan. 4-6, 1950. F. J. Kingma, 121 E. Weber Rd., Columbus 2, Ohio.

Oklahoma Veterinary Medical Association. Annual meeting. Jan. 9-10, 1950. Lewis H. Moe, 408 Life Sciences Bldg., Oklahoma A. & M. College, Stillwater, Okla., secretary.

(Continued on page 32)

SELECTIVE CHEMOTHERAPY

Hypodermically and Orally

For antibacterial chemotherapy there are available a number of sulfonamide compounds.

Everyday Streptococcus Infections . . . **Owing to its relatively good tolerance, Neoprontosil is of particular value in many streptococcus infections which are encountered in everyday veterinary practice, including septicemia, strangles, metritis, mastitis, distemper and meningitis. Relatively small doses have yielded very good results.**

Write for booklet which contains detailed discussion of indications, dosage, manner of use, and side effects.

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***Brand of* AZOSULFAMIDE**

Disodium 4-sulfamidophenyl-2-azo-7-acetylamino-1-hydroxynaphthalene 3,6-disulfonate

HOW SUPPLIED

For Oral Administration: Neoprontosil tablets of 5 grains, bottles of 50, 500 and 5000. (Caution: Not to be used for injection.) Neoprontosil capsules of 3 grains, bottles of 50 and 500. (Caution: Not to be used for injection.)

For Parenteral Administration: Neoprontosil 5 per cent solution, bottles of 125 cc. with rubber diaphragm stopper.

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Test after test insures its unchanging quality. The Swift chemist above is doing distillation tests on the protein content of Pard . . . another step in the quality-supervision of Pard to assure uniformity in nutrient content.

Pard is formulated to the exacting specifications of the Swift Research Laboratory . . . a laboratory noted for thoroughness and its superb staff of scientists and specialists in every field related to the feeding and health of dogs.

Pard has been *proved* capable of sustaining optimum health by the results of test feedings conducted on generation after generation of dogs in Swift's famous kennels. On a diet of Pard and water, these dogs have shown excellent growth and maintenance. Reproduction normal. Irrefutable proof that Pard contains every known essential for good nutritional health. Be safe! Feed and recommend rich, nourishing Pard—the complete "one-dish-dinner"!

(Continued from page 28)

Indiana Veterinary Medical Association. Annual meeting. Severin Hotel, Indianapolis, Ind., Jan. 12-14, 1950. W. W. Garverick, Zionsville, Ind., secretary.

Tri-State (Arkansas, Mississippi, Tennessee) Veterinary Conference. Peabody Hotel, Memphis, Tenn., Jan. 16-17, 1950. H. W. Nance, Lawrenceburg, Tenn., secretary.

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Regularly Scheduled Meetings

Bay Counties Veterinary Medical Association, the second Tuesday of each month. George E. Martin, 530 Stockton Ave., San José, Calif., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Thomas Eville, Route 1, Box 136H, Fresno, Calif., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

East Bay Veterinary Medical Association, bimonthly, the fourth Wednesday. O. A. Soave, 5666 Telegraph, Oakland, Calif., secretary.

Greater St. Louis Veterinary Medical Association. Ralston-Purina Research Building, St. Louis, Mo., the first Friday in February, April, June, and November. W. C. Schofield, Dept. of Animal Pathology, Ralston-Purina Co., St. Louis 2, Mo., secretary.

Houston Veterinary Medical Association, Houston, Texas, the first Thursday of each month. Edward Lepon, Houston, Texas, secretary-treasurer.

Illinois Valley Veterinary Medical Association, the second Wednesday of even-numbered months. R. A. Case, 400 S. Garden St., Peoria, Ill., secretary.

Indiana Tenth District Veterinary Medical Association, the third Tuesday of each month. J. J. Arnold, Box 144, New Castle, Ind.

Jefferson County Veterinary Society, Louisville, Ky., the first Wednesday evening of each month. F. M. Kearns, 3622 Frankfort Ave., Louisville 7, Ky., secretary.

Keystone Veterinary Medical Association. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., the fourth Wednesday of each month. Raymond C. Snyder, N. W. Cor. Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Massachusetts Veterinary Association. Hotel Statler, Boston, Mass., the fourth Wednesday of each month. C. L. Blakely, Angell Memorial Animal Hospital, 180 Longwood Ave., Boston, Mass., secretary-treasurer.

Michiana Veterinary Medical Association. Hotel Elkhart, Elkhart, Ind., 7:00 p.m., the second Thursday of each month. R. W. Worley, 3224 Lincoln Way West, South Bend, Ind., secretary.

Michigan, Southeastern Veterinary Medical Society. Herman Kiefer Hospital, Detroit, Mich., the second Wednesday of each month from October through May.

Milwaukee Veterinary Medical Association. Wisconsin Humane Society, 4150 N. Humbolt Ave., Milwaukee, Wis., the third Tuesday of

(Continued on page 40)

American Farmers *Can* Produce More Pork on Less Grain

If you could add up the grain you've saved in your own community by reducing pig losses, we'll bet it would run into thousands of bushels.

The Purina organization is also helping to reduce the waste of grain by the manufacture and distribution of properly blended supplements. Careful records kept on 400,000 hogs raised on the Purina Plan at the Purina Research Farm show that farmers can get 1/3 more pork from their grain than the average U. S. farmer. This is made possible by the use of Purina Hog Chow, a supplement for grains. These figures tell the story:

Feed Required to Make 100 lbs. of Pork

RALSTON PURINA CO., St. Louis 2, Mo.

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Twenty-five words or less, $2.50; 8 cents for each additional word. Replies sent in care of the Journal, 25 cents extra.

Remittance must accompany order.

Deadline for want ads 15th of month preceding date of issue.

Names of classified advertisers using key letters cannot be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 So. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Positions

Experienced veterinarian desires assistantship in mixed or small animal practice that will lead to future ownership. Licensed in Connecticut, Maryland, and Pennsylvania. Address "Box K 4," c/o Journal of the AVMA.

Displaced veterinarian, graduate of University of Munich, eight years' practical experience, desires assistantship with established veterinarian. Speaks little English, but fluent in German, Polish, Ukrainian, and Russian. Address Dr. Jaroslaw Wynnyckyj, The Catholic Committee for Refugees, 265 West 14th Street, New York 11, N. Y.

Polish veterinarian, recently arrived from Europe, wishes a position as an assistant or in any other associated field. Single, seven years' experience. Able to speak some English; read well. Address "Box K 9," c/o Journal of the AVMA.

Cornell graduate, married, Christian, three years' small animal experience, desires position with small animal practitioner in New York state. Give particulars, including requirements, facilities, salary, in first communication. Address "Box K 12," c/o Journal of AVMA.

Wanted—Practices

Graduate, experienced veterinarian wants to lease or buy active small animal or mixed practice in any state. Would prefer practice in Pennsylvania, New Jersey, Maryland, or Delaware. Give full details. Can settle suitable practice at once. Address "Box G 16," c/o Journal of the AVMA.

Wanted—Veterinarians

VETERINARIAN WANTED — Mixed practice, established in 1908, full charge of new hospital close to Kalamazoo, Mich.; percentage basis or will rent. State age and school. Good future for hard worker. Address Dr. J. Lavere Davidson, 2804 West Michigan Ave., Kalamazoo 59, Mich.

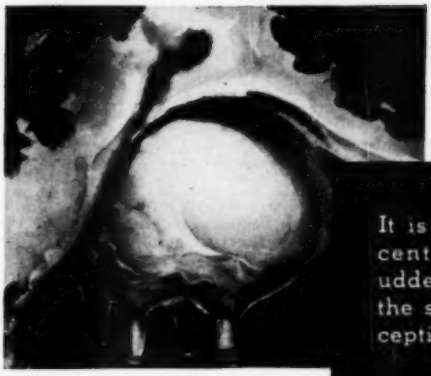
Veterinarians wanted for permanent positions on hospital staff in New York City, working with small animals. Applicants must be able to obtain New York state license. Address "Box J 3," c/o Journal of the AVMA.

Veterinarian for assistant in small animal hospital in southern California. Must have California license. Seventh Day Adventist preferred. State age, religion,

(Continued on page 36)

For Better Management of MASTITIS

Administer Penicillin in



PENICLE®

Antibiotic Vehicle

It is important to maintain effective concentrations of penicillin in the affected udder until all *S. agalactiae* have reached the stage of division—when they are susceptible to the drug.

A single injection of penicillin-in-PENICLE establishes therapeutic levels of the drug in the lactating udder, and maintains them for at least three days or six milkings. In a majority of cases, this is sufficient time to ensure that even slowly dividing strains will be killed. In some instances, however, a second injection may be necessary after three days to destroy the penicillin-sensitive organisms which were dormant or not dividing during the first seventy-two-hour period.

PENICLE is a water-in-oil emulsion which offers outstanding advantages as a retaining vehicle in antibiotic therapy. The use of PENICLE with penicillin in the treatment of bovine mastitis due to *S. agalactiae* results in better dispersion of the drug throughout the gland, and maintenance of therapeutic levels for a longer period in the affected quarter. With PENICLE, *frequent injections are not required; control of therapy remains in the hands of the veterinarian.*

PENICLE is sold only to graduate veterinarians. You can use the soluble crystalline penicillin of your choice in PENICLE.

SUPPLIED: Bottles containing 100 cc.

FOR TOPICAL ANTIBIOTIC THERAPY

TYROTHRICIN SOLUTION VETERINARY *(Wallace)*

For application in localized infections caused by streptococci, staphylococci, and corynebacteria.

Not to be used in mastitis

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NEW YORK 8, N. Y.

1. Foley, E. J.; Stults, A. W.; Lee, S. W., and Byrne, J. V.: Am. J. Vet. Research 10: 66 (Jan.) 1949.

(Continued from page 34)

marital status, and experience. Address "Box K 5," c/o Journal of the AVMA.

NOTICE — Public notice is hereby given that applications for the position of meat inspector for the city of Manitowoc, Wis., will be received by the city clerk of said city in his office until 5:00 o'clock P.M. on Monday, Aug. 15, 1949. Application blanks for said position can be had by writing to or applying at the city clerk's office in the city hall. Applicant must be a graduate veterinarian with at least five or six years' experience in making antemortem and postmortem examinations as required by the U.S. Bureau of Animal Industry. Must possess a high degree of tact in dealing with processors and distributors and the general public, integrity, resourcefulness, good judgment, and thoroughness in inspection work.

Graduate veterinarians wanted for regulatory work in state of Oregon. Beginning salary approximately $4,000. Good opportunity for advancement. Address State Civil Service Commission, 444 Center Street, Salem, Ore.

Wonderful opportunity for veterinarian to locate in Las Animas, Colo. — livestock feeding, ranging, and farming community. Abundant business, with no veterinarian located in the county or within a radius of 20 miles. Large number of animal house pets in town. Last veterinarian left to accept government inspection position. Contact William Kenworthy, Secretary Las Animas Farm Bureau, Las Animas, Colo.

Assistant wanted in general practice in northeastern Maine; 80 per cent cattle practice. Equipment and rent furnished with salary. Must be graduate of recognized school and honest. Send snapshot and state religious faith. Address "Box K 8," c/o Journal of the AVMA.

Graduate veterinarian wanted as assistant in mixed practice, 75 per cent small animal. Applicant with rural background preferred. State full particulars in first letter, including salary desired. Address Dr. H. E. Viergutz, Farmington Veterinary Clinic, 32809 Grand River, Farmington, Mich.

Young veterinarian with some experience in small animal work wanted for hospital in Washington, D.C. Opportunity to become partner. Present owner in poor health. Give full details and phone number in reply. Address "Box K 13," c/o Journal of the AVMA.

For Sale or Lease—Practices

Growing mixed practice in Southeast, predominantly small animal. Includes 7-room building, modern equipment, x-ray, drugs, runs, etc. Now grossing $11,000. Price $9,000. Address "Box K 6," c/o Journal of the AVMA.

FOR SALE — Growing small animal hospital. Main thoroughfare in Los Angeles area. Modern, well equipped, ample drugs, 12 runs, x-ray, neon signs. No property involved; excellent long-term lease. Full price $11,000; $6,000 will handle. Address "Box F 6," c/o Journal of the AVMA.

Large animal hospital, with apartment, for lease in southern California. Excellent opportunity for man interested in large animal practice. Address "Box K 7," c/o Journal of the AVMA.

(Continued on page 38)

GEXANE...

One APPLICATION DESTROYS MANGE MITES!

GEXANE . . . a 1% concentration of the Gamma Isomer of Hexachlorocyclohexane . . . is the newest, fastest and most powerful insecticide yet developed for the treatment of parasitic infestation. One application kills ticks . . . destroys mites, including Sarcoptes scabiei and Demodex canis . . . kills flies, fleas and lice.

Important, also, to both doctor and owner is the fact that GEXANE has no disagreeable odor, and when used as directed is non-toxic to all species of vertebrate animals, including man.

GEXANE is supplied both as a liquid in 4 oz. bottles, pints and gallons . . . and as an ointment in ¾ oz. tubes and pound jars.

Write for literature. Directions for use included with shipment.

R. J. STRASENBURGH Co.
Pioneering in Veterinary Pharmaceuticals Since 1886
ROCHESTER 4, N. Y.

(Continued from page 36)

FOR SALE OR LEASE — Equipped small animal hospital. Located in metropolitan New Jersey. Excellent opportunity. Address "Box K 2," c/o Journal of the AVMA.

FOR SALE — Owner of extensive small animal practice, located in Florida, must sell due to ill health. This is one of the finest practices in the United States and built on professional accomplishment. Room for 2 men. A large animal practice could be developed in connection. Practice grosses better than $54,000 annually. Buyer must furnish professional and financial references. Requires $20,000 to handle. Will stay with purchaser two months. Please do not apply unless you are financially able to purchase same and capable of conducting large practice. Address "Box K 1," c/o Journal of the AVMA.

FOR SALE OR LEASE — Modern small animal hospital with living quarters. Grossed $12,000 last year; 80 per cent small animal. Sixty miles from Detroit. Will sell for actual cost of building and equipment, which is less than one year's gross, or will lease for $120.00 per month. Address "Box K 3," c/o Journal of the AVMA.

FOR IMMEDIATE SALE — Well-established mixed practice; small animal hospital and modern home included. Address "Box K 10," c/o Journal of the AVMA.

For Sale—Miscellaneous

FOR SALE — At saving of $200. Floor sample. Universal Fieldmaster Portable X-Ray Unit # U-3114 25 Ma. and 85 P.K.V., consisting of head, control, demountable stand, foot switch, and timer. Value $618, our price $418, F.O.B., Philadelphia, Pa. Offered subject to prior sale. Surgical Supply Service, 825 Walnut Street, Philadelphia 7, Pa.

Miscellaneous

WANTED — Used equipment for small animal practice. Instruments, surgery and examination tables. small x-ray, centrifuge, microscope, etc. Also portable cages. Address "Box K 11," c/o Journal of the AVMA.

Books and Magazines

TRAINING THE DOG — rev. 8th ed. by Will Judy. All breeds, all phases, for pet owner or prof. trainer. $3. Keep up on dogs—Dog World $3 yr., 2 yrs. $5. Judy Publishing Co., 3323 Michigan Blvd., Chicago 16.

For Sale—Artificial Insemination Supplies

ARTIFICIAL INSEMINATION INSTRUMENTS — Essential equipment, replacement parts and materials, designed and manufactured especially for artificial insemination. Prompt delivery. New catalog. Address: Breeder's Equipment Co., Flourtown, Pa.

Cancer.—The fact that the cure of cancer is no more just-around-the-corner today than it was in the days of Virchow and Billroth is not a valid reason for not donating funds for cancer research. Surrendering to such an enemy of the human race as cancer is not going to happen.

"Dogs home-run daily for Ribbon"

SAYS KELLIE

Yes, dogs race for that home plate when it's filled with "smackin' good" Ribbon. Contains highest quality proteins—skim milk, homogenized fish. Meat meal, too! And the carbohydrates are thoroughly cooked for digestibility.

Here's a big league formula—a pennant winner! Gro-Pup has the Seal of Approval of the AVMA and AAHA Committee on Foods. Vitamin values (Ribbon has every vitamin and mineral dogs are known to need) are stated *after* cooking.

The stands will cheer when you tell them that Gro-Pup is not 70% water like most canned dog foods. On a dry-weight basis, it takes about 5 pound-cans of dog food to give as much nourishing food as 1 25-oz. box of Gro-Pup Ribbon!

MADE BY Kellogg's OF BATTLE CREEK

Gloomy Prospects.—Fact frankly set forth, with good intent, gloomy as it may seem, is never out of order. For example, there is no wrong in pointing out that the world's population of 5,000 million by the end of this century will have a tough food problem to solve. The arable acreage is fixed and known. The farmers' capacity to produce more food and the veterinarians' ability to stop losses, spoilage, and wastage have their limitations. Young men entering agricultural and veterinary colleges today will enjoy mounting interest in their job of postponing the evil hour.

(Continued from page 32)

each month. Kenneth G. Nicholson, 2161 N. Farwell Ave., Milwaukee, Wis., secretary.

New York City Veterinary Medical Association. Hotel Pennsylvania, New York, N. Y., the first Wednesday of each month. C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. I. N. Bohlender, Box 588, Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. James R. Ketchersid, 666 East Highland Avenue, San Bernardino, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. E. W. Paul, Box 866, Redwood City, Calif., secretary.

Redwood Empire Veterinary Medical Association, the second Tuesday of every other month. Charles D. Stafford, Novato, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the fourth Friday of each month. R. C. Goulding, 11511 Capitol Avenue, Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the third Tuesday of each month. Mitchell Smith, 3740 Rosecrans Boulevard, San Diego, Calif., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. D. H. McDole, 8674 Melrose Ave., Los Angeles 46, secretary.

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Foreign Congresses

Fourteenth International Veterinary Congress. London, England, Aug. 8-13, 1949.
General Secretary, Permanent Committee: Prof. L. de Blieck, Kwartellaan 51, The Hague, Netherlands.
General Secretary, Organizing Committee: Mr. W. G. R. Oates, 9 Red Lion Square, London, W. C. 1, England.
Secretary, United States Committee: J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill. (Applications for membership from veterinarians in the United States may be obtained by writing to Dr. Hardenbergh.)

National Veterinary Medical Association of Great Britain and Ireland. London, England, Aug. 12-15, 1949. F. Knight, General secretary, 36, Gordon Square, London, W.C.1.

Binding Technical Journals.—Proof that science habitually defeats its utilitarian application is the old custom of binding the volumes of technical periodicals without the advertisements, which are a true and complete tabloid of how science is put to use. There is nothing deceptive in the advertisements of a well-managed journal, which is more than can be said of all the reading material.

You're Right, Doctor . . .

CANINE CRYSTOIDS®

ANTHELMINTIC

Really are EFFECTIVE and SAFE!

Yes, Canine Crystoids Anthelmintic are probably the safest and most effective of the anthelmintics . . . because each pill contains 0.2 Gm. Caprokol hexylresorcinol, clinically established as unusually safe and effective in the treatment of both round worm (Ascaris) and hookworm infestations in dogs.

Canine Crystoids Anthelmintic are characterized by these four clinical conclusions:

1. A single therapeutic dose, properly given, is from 90 to 100 per cent efficient.
2. The toxicity of the drug is clinically negligible. It is *free from after-effects.*
3. It is efficient against *both* Ascaris and hookworm infestations.
4. The action is *vermicidal.* The worms are killed outright—not merely stupefied—and consequently the danger of migration is obviated.

Supplied in packages of 5 and 100 pills, and in economical hospital packages of 500 pills. *Dosage:* 1 pill for very small puppies of smaller breeds, 2 pills for those of larger breeds. Dogs weighing 20 pounds or over, 5 pills.

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Canine Distemper

Vaccine (Intradermal)

This product has proved itself under laboratory and field tests. More and more veterinarians are finding it the answer to their distemper immunizing problems. This vaccine is the only product of its kind to be originally designed for Intradermal administration.

Immunization by the Intradermal route is not new, but, by all standards of comparison, is so much superior to other accepted routes of injection, that it undoubtedly will be the method of administration of the future, not only of canine distemper vaccines, but of many other products.

Give this vaccine a trial in your practice, as many successful and satisfied veterinarians have done.

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ELIMINATES REACTION RISKS

Jen-Sal

HOG CHOLERA VACCINE

Crystal Violet Type *Tissue Origin*

Your clients appreciate Jen-Sal Hog Cholera Vaccine because it means no reaction hazards, no curtailment of feeding schedules, no risks of premises contamination with virulent virus.

There are no substitutes. Jen-Sal alone supplies Hog Cholera Vaccine of Tissue Origin that is rendered innocuous by Crystal Violet dye—an exclusive process that insures retention of maximum antigenicity.

A single 5 cc. dose of this new-process Crystal Violet Vaccine of Tissue Origin confers protection on healthy swine against field exposure for a period of approximately one year.

Vial 60 cc.
(Code: Vivac) $6.00

Vial 250 cc.
(Code: Vilet) $25.00

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